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PROGESTERONE IN PRE-ECLAMPTIC TOXAEMIA

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Recent work on the physiology of pregnancy has produced evidence which strongly suggests that the luteal hormone progesterone is necessary for the maintenance of gestation and for the nutrition of the developing uterine contents. In some species the hormone is produced essentially by the corpus luteum, and the removal of the ovaries or of the corpus luteum leads to an interruption of the gestation. In other species, including the human, removal of the ovaries is consistent with continuation of a normal gestation, and it is presumed that in these species the luteal hormone is produced by the placenta, from which organ it has, indeed, been recovered.

Experimental Work on Animals

In experiments performed some time ago (Robson, 1934) it was desired to determine the possible effect of the placental activity on the uterus following removal of the foetuses. For this purpose the technique described by Weymeersch (1912) and by Hammond (1917) was used; the embryos were removed under aseptic precautions in pregnant rabbits through small incisions in the uterine wall. When the operation was performed at about the mid-stage of pregnancy or shortly afterwards it was found, as had been previously described, that the placentae might be retained for varying periods within the uterine lumen and were then expelled. When, however, the embryos were removed at a later stage of pregnancy the course of events was quite different. The animals very rapidly developed symptoms of acute intoxication and died, sometimes within twenty-four hours of the operation. On post-mortem examination an acute toxic condition was found, and it appeared likely that the source of the intoxication was within the uterus.

In further experiments precautions, including strict asepsis, were used, but the results were nevertheless the same. It appeared possible that the removal of the embryos was followed by acute changes within the remaining uterine contents which resulted in an intoxication of the animal. As the uterus was unable to expel these contents death of the animal rapidly followed. Since removal of the embryos is followed by a cessation of the luteal secretion (Hammond, 1917), it was concluded that the condition within the uterus might be due to a failure of the nutrition of the placenta following the removal of the luteal secretion.

More recent experiments on the function of the corpus luteum during pregnancy have also yielded some interesting and suggestive results. In the rabbit the removal of the pituitary during pregnancy is followed by a degeneration of the corpus luteum and by an interruption of the gestation; when the operation is performed after about the middle of pregnancy the uterine contents are expelled within twenty-four to forty-eight hours. By the administration of small doses of gonadotropic hormone it is possible to maintain the activity of the corpus luteum after the removal of the pituitary, and when gonadotropic hormones are administered to animals hypophysectomized during pregnancy it is possible to maintain the gestation (Robson, 1936). In some such experiments the maintenance of the luteal function was only very partial; as a result the gestation was not maintained and death of the embryos ensued, but the uterine contents were not expelled. Under such conditions toxic symptoms occasionally supervened rapidly, leading to the death of the animal.

Details of One Experiment

In one such experiment a histological examination of the tissues was made. This animal was hypophysectomized on the seventeenth day of pregnancy, and then was given small doses of gonadotropic hormone twice daily. Careful palpation, together with the examination of the weight curve, showed that after a few days the pregnancy was not progressing normally. On the morning of the sixth day after the removal of the pituitary the animal went into convulsions. It was obviously very ill, and was killed in order that a subsequent post-mortem examination might be as satisfactory as possible.

Post-mortem examination showed an acute toxic condition; the uterine contents were in a state of partial reabsorption. The pituitary had been completely removed. The corpora lutea showed considerable small-cell infiltration.

Professor Drennan very kindly carried out a microscopical examination of the liver, kidneys, and spleen, and reported as follows.

Spleen.—The only feature in this is marked engorgement of the pulp sinuses.

Kidney.—This organ shows acute and subacute lesions. The latter take the form of surface depressions due to disappearance of tubules, with bunching together of the surviving glomeruli and fibrous overgrowth. It is not possible to give the age of this with absolute accuracy, but it may be regarded as from a week or ten days at least. In places this loss of tubules and interstitial fibrosis extends inwards as far as the pelvis. The glomeruli and vessels do not appear appreciably altered in these areas.

The acute lesions, which have the same general lineal distribution from pelvis to cortex, consist of dense cellular infiltrations. The cells vary in proportion in different patches, but there are many polymorphs, together with various mononuclear types (such as lymphocytes and histiocytes). This infiltration is in the interstitial tissues, causing separation of the tubules, many of which are also disintegrated; above are dilated tubules. No organisms could be demonstrated in these acute lesions, though the appearance and characters of the lesions suggest a bacterial or toxic origin. The kidney otherwise shows minor changes; the convoluted tubules generally are swollen, but the glomeruli show no specific change.

Liver.—The liver cells in the central two-thirds of the lobules show loss of distinct outline, their cytoplasm is vacuolated and contains small yellow granules (? bile); the nuclei, with few exceptions, stain quite well. The cells of the outer third stain more uniformly and darkly—a more normal appearance. Scattered irregularly in lobules and in portal tracts are small groups of blood cells (polymorphs and myelocytes) and some swollen endothelial cells. These groups are within the sinusoids of the lobules or in the tissue of the portal tract. There is no fibrosis; the bile ducts and portal vessels show no abnormality.

It was not possible to test for fat in the material available, and so no statement can be made as to the cause of the central vacuolation of cells above noted. The general appearance suggests an acute toxic damage and some stimulation of haemopoietic tissue.

These experiments showed that toxic conditions may be produced in the pregnant rabbit when pregnancy is interrupted without a complete expulsion of the uterine contents, and that such conditions are associated with a failure in the secretion of the luteal hormone. They suggested the possibility that toxic states observed during pregnancy in women might also be associated with an insufficiency in the luteal secretion, and that treatment with the luteal hormone (progesterone) might have beneficial effects. It was therefore decided to determine the effect of treatment with corpus luteum hormone in a series of pre-eclamptic cases. Messrs. Schering Ltd. very kindly put a generous supply of proluton at our disposal: 1 c.cm. of the preparation used contains 5 mg. of synthetic progesterone. This was administered intramuscularly in all cases.

Clinical Experiments

So far only twelve cases have been treated. The results have on the whole been encouraging, but the data are necessarily limited, since the number of severe cases suitable for experimental treatment passing through one hospital is small. This preliminary report has therefore been communicated in the hope of encouraging other investigators to use a similar treatment, and thus lead to a more rapid collection of information.

The following criteria were used in the choice of cases. (1) The blood pressure was high, the systolic being 160 or over and the diastolic 90 or over. (2) Oedema was present in all cases, and marked in most of them. (3) Albumin was present in the urine, often in large quantities. (4) The urea concentration was normal, and the blood urea was within normal limits (20 to 40 mg. per cent.). (5) The general clinical impression and the symptoms (such as headache, visual disturbances, and vomiting) were such as to suggest that eclampsia might be imminent.

In ten out of twelve cases conservative treatment had been tried at home under the supervision of the hospital ante-natal clinics or under the patient's own medical attendant. The period of treatment before admission extended over one to four weeks, and the treatment included rest in bed on a low protein diet. The patients were admitted to hospital only when they failed to show improvement or became worse under conservative measures. Two of the cases were admitted as emergencies without any previous treatment.

In all cases treatment was restricted essentially to the administration of progesterone, but the following basic precautions were taken. (1) A balanced diet of approximately 1,650 calories was given, not salt-free and not protein-free, though the protein intake excluded red meat. (2) In every case where oedema was a marked feature fluid intake was restricted to less than 40 ounces until the fluid output was greater than the intake, and the oedema showed signs of disappearing or had disappeared. (3) Where headache was severe luminal was given in half-grain doses twice or three times a day. In one case (No. 4), where epigastric pain, acute headache, and sudden rise in blood pressure developed when only one dose of progesterone had been given, resort was had to venesection and the use of morphine. Progesterone was given in 5 mg. doses daily for the first three or four days, and thereafter, depending on the response, at longer intervals. The results are presented in Table I, the symptoms being graded + to ++++ according to the presence and intensity of headache, eye symptoms, vomiting, and oedema.

Several features of the response to treatment are worthy of note. In the first place, none of the patients developed fits, and all recovered. Secondly, every patient showed a gradual improvement as judged by the signs and symptoms. Blood pressure fell (though it is difficult to estimate what significance can be attached to such a comparatively inaccurate standard), while albuminuria, as estimated by Esbach's method, showed a gradual diminution in most cases. In the third place, the final result to the mother was complete recovery of kidney function eventually in all cases except one. In this case (No. 2) the patient was left with a mild nephritis. Lastly, although foetal mortality was high (six out of twelve cases), all these deaths were by no means attributable to the toxaemic condition.

The cause of the foetal deaths requires additional consideration. The first foetal death (No. 1) occurred *in utero* before the woman came into the hospital. She was admitted as an emergency, and the foetal heart was never heard. The second foetal death (No. 2) was definitely due to prematurity. The third foetus was born in a deformed condition, and the labour, which was prolonged and difficult, showed abnormality of uterine action (non-polarity of the uterus). Special interest may possibly be attached to the fifth foetal death (No. 7). The mother's response to treatment was rapid and satisfactory, so that the dosage was reduced to 5 mg. every fourth day. It was on the fourth day after her last injection (five weeks after the beginning of treatment) that the mother complained of feeling worse and showed a rise in the blood pressure. On examination the foetal heart, which had been heard on the previous day, was no longer audible. Surgical induction was performed, and the child was stillborn. It is possible that his death might not have occurred if more frequent doses had been given.

In one case (No. 4) it was observed that treatment with corpus luteum hormone appeared to cause a delay in the onset of labour. Because of failure to improve beyond a certain point the membranes in this case were ruptured artificially at twenty-nine weeks, and the treatment with progesterone was continued. The patient did not go into labour for five days, and then only after the temporary cessation of treatment. Because of this, and because of the high foetal mortality in the earlier cases, induction of labour at or near term when the condition of the mother

TABLE I

Case	Gestation (Weeks) at the Beginning of Treatment	Day	Symptoms	B.P.	Urine Albumin (grammes per litre)	Total Dose of Progesterone	Fate of Foetus	Remarks
						mg.		
1 (B600)	26	Ad.	++++	200/150	5.5	30	28 wks; stillborn	Emergency; cleared up entirely in the end
		2nd	+++	190/140	5.5			
		3rd	+++	190/140	5.0			
		4th	+++	180/130	5.5			
		5th	++	180/130	2.5			
		7th	+	155/125	2.0			
		4th (p.p.)		140/100	trace			
2 (B782)	24	Ad.	++++	190/120	5.0	50	26 wks; S.B. (prematurity)	Accouchement forcé; blood urea rising; left with mild nephritis
		2nd	++	160/110	4.0			
		3rd	++	185/120	3.25			
		4th	++	170/120	3.25			
		6th	+ (swinging thereafter)	140/110	1.75			
		3rd (p.p.)	++	185/130	1.0			
3 (B701)	36	Ad.	+++	165/120	1.75	25	Term; S.B. (deformed)	Non-polarity of uterus, cervix incised; forceps
		2nd	++	140/100	1.0			
		3rd	++	155/100	0.5			
		4th	++	150/110	0.5			
		6th	+ (no further improvement till delivery)	140/110	1.75			
		5 wks. (p.p.)		135/85	clear			
4 (B732)	28	Ad.	++++	160/96	6.0	35	30 wks; S.B.	Induction of labour; clinically a very severe case
		2nd	++++ (venesection)	195/120	6.0			
		3rd	++++	150/80	3.0			
		4th	++++	170/100	11.0			
		5th	+++	170/100	12.0			
		11th	+++ (thereafter maintained approx. this level)	175/100	2.25			
		2nd (p.p.)		120/80	trace			
5 (B761)	32	Ad.	+++	160/100	12.0	45	35 wks; born alive, did well	Induction because mother and child in good condition
		2nd	+++	160/100	7.0			
		3rd	+++	160/100	8.0			
		4th	++	145/100	3.5			
		8th	+	160/120	1.25			
		11th		130/100	0.25			
		3rd (p.p.)		130/100	1.0			
6 (B950)	30	Ad.	++++	190/120	8.0	30	33 wks; alive	Spontaneous labour
		2nd	+++	150/120				
		3rd	++	148/100	4.0			
		4th	++	145/100				
		10th		118/88	clear			
		3rd (p.p.)		100/65	clear			
7 (B985)	31	Ad.	++++	198/132	12.0	50	36 wks; S.B.	Foetal heart not heard for 24 hours before induction
		2nd	+++	170/120	12.0			
		3rd	+++	178/120	12.0			
		4th	+++	192/118	12.0			
		6th	++	152/92	1.5			
		8th	+	154/105	2.0			
		1st (p.p.)		135/90	0.75			
8 (B1153)	38	Ad.	+++	168/110		25	Term; alive and well	Induction because mother and child in good condition
		2nd	++	144/104				
		3rd	+	138/98	1.5			
		4th	+	140/102	1.0			
		6th		132/94	1.5			
		8th		144/96	0.5			
		16th (p.p.)		106/70	clear			
9 (B1155)	38	Ad.	++	160/90	2.0	25	Term; alive and well	Induction because mother and child in good condition
		2nd	++	148/96	1.25			
		3rd	+	144/98	1.25			
		4th		136/94	1.5			
		8th		152/96	0.5			
		13th		116/76	clear			
		4th (p.p.)		116/76	clear			
10 (B1252)	39	Ad.	++++	184/94	7.5	25	Term; alive and well	Born spontaneously. Recurrence of symptoms 2nd day p.p.; cleared up with further treatment
		2nd	+++	146/114	4.0			
		3rd	+++	160/114	3.75			
		4th	++	146/104				
		2nd	+	148/106	1.0			
11 (B1273)	34	Ad.	+++	162/114	10.0	35	Alive and well	Born spontaneously
		2nd	++	154/110	4.0			
		3rd	+	148/108	1.75			
		4th	+	166/114	2.0			
		5th		166/114	1.0			
		10th		160/112	1.5			
		11th (p.p.)		124/96	1.0			
12 (B952)	32	Ad.	++++	190/110	8.0	20	32 wks; S.B.	Labour occurred on the 2nd day, B.P. rising on 2nd day p.p.; progesterone continued
		(p.p.) 2nd	++++	170/100				
		3rd	++++	205/110				
		6th	++	146/108	0.25			
		8th	+	134/104	1.3			

had reached a satisfactory but stationary point was resorted to in most of the later cases. This measure was attended with marked success.

Discussion

In presenting the results in these cases we fully realize the difficulties of assessing adequately the part played by the treatment with progesterone. It is possible that rest in bed under hospital conditions might account for the undoubted amelioration in the symptoms, and that the same series of cases treated conservatively in hospital would have shown the same ultimate results. In view of the difficulties of devising a true control experiment, we decided that it might be of value to study the figures for the previous year. We therefore surveyed the records of all pre-eclamptic cases which were admitted to hospital between the dates of our experiment (May 1 to October 31, 1936), and compared these with the records of all

TABLE II

	1935	1936
Total cases admitted with pre-eclampsia	21	31
Mild and moderate	11	18
Severe	10	13

TABLE III.—*Comparing the Result of Conservative Treatment and Treatment with Progesterone in Severe Cases*

	1935	1936
No. of cases	10	13
No. of cases conservatively treated	10	1
No. of cases developing fits	4	1
No. of deaths	2	1
No. of cases treated with progesterone	0	12
No. of cases developing fits	—	0
No. of deaths	—	0

such cases admitted between May 1 and October 31, 1935. Similar periods were chosen in order to exclude the possibility that seasonal variations might affect the incidence and severity of the condition.

The results are given in Tables II and III. Out of ten severe cases admitted in 1935 and treated conservatively, four developed fits, and two patients died; while out of twelve severe cases treated in 1936 with corpus luteum hormone none developed fits and none died. The results therefore appear to be suggestive and encouraging.

In an investigation of the possible value of progesterone in the treatment of certain toxaemias of pregnancy it was obviously desirable to select severe cases, since the significance of results obtained could then be more easily estimated. At the same time it is well realized that if the treatment was definitely shown to be effective it would be advisable to apply it at an earlier stage, and to determine whether under such conditions it might not be of prophylactic value.

Summary

1. Certain experiments, in which toxic conditions leading to death were produced in pregnant rabbits, are described; these conditions were associated with a failure in the secretion of the luteal hormone.

2. The results obtained following the administration of progesterone in twelve cases suffering from severe pre-eclamptic symptoms are given. Clinical improvement appears to have been produced in these cases.

3. It is evident that the numbers are too small to establish formal proof of the efficacy of the treatment, and the results are published at this stage because it would take many years to collect adequate data in a single hospital. The results appear to be sufficiently encouraging to deserve testing on a wider scale without delay.

We should like to express our gratitude to the honorary staff of the Elsie Inglis Memorial Hospital for permission to use some of their cases, and to the Medical Research Council for defraying the expenses of the experimental part of this investigation.

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C. Kroetz (*Med. Klinik*, November 6, 1936, p. 1521) points out that carbon monoxide poisoning is a danger which may arise in garages, streets, factories, tunnels, and domestic houses. It may produce in the heart muscle haemorrhages and necrotic patches especially close to the papillary muscles of the mitral valve. Entering the upper respiratory passages it affects the vagus, causing spasm of the coronary blood vessels. Later, arteriosclerotic changes occur in the vessel walls. The electrocardiogram often gives evidence of these pathological changes. Clinically, a heart with necrotic foci following carbon monoxide poisoning reacts more quickly with attacks of angina pectoris. Kroetz, acting as referee in a compensation case, showed that symptoms of cardiac stenosis must be carefully looked for in cases of CO poisoning. In 1915 an engine driver of 38 had an attack of angina pectoris after working in a tunnel with a known high CO content. Two other well-authenticated attacks occurred in the same manner in 1922 and 1928. Previous to 1915 the patient had had no heart trouble. Although he was off work for 285 days between 1915 and 1922, his symptoms were put down to neurosis. He was pensioned off in 1933. In 1936, upon re-examination, his condition had not deteriorated. Syphilis and senile arteriosclerosis had been excluded in 1915.

THE RELATION BETWEEN THE HYPOCHROMIC ANAEMIAS AND IRON DEFICIENCY

BY

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There has been much speculation as to the mode of action of iron in the hypochromic anaemias, and especially as to the reason why it requires to be given in large doses. The successful treatment of the hypochromic anaemias with large doses of iron has been one of the most encouraging chapters in medicine during the last decade, and iron can now be regarded as a specific remedy.

Schulten (1930) has emphasized the importance of large doses in the case of ferrum redactum. He showed that in some cases this preparation could be given for four weeks in doses of 2 grammes (30 grains) daily without any response, but when the dose was raised to 6 grammes (90 grains) there was an immediate rise of reticulocytes and return of the blood picture to normal. In this country and in the U.S.A. the preparations of iron most in vogue until recently have been iron and ammonium citrate in doses of from 60 to 90 grains daily, and pil. ferri carb. (Blaud's pill) in doses of from 45 to 90 grains daily. Although it has been recognized that some patients respond to considerably smaller doses (Witts, 1933), the necessity for the large doses mentioned as average optimum doses has been very clearly established in clinical experience (Dameshek, 1934; Heath, 1933; Schulten, 1930; Witts, 1933). And there is no question that the specificity of iron therapy has only been generally accepted since these preparations have been used in large doses as originally suggested by Blaud (1832).

Definition of Hypochromic Anaemia

A hypochromic type of blood picture may be found in association with almost any disease picture, and may respond to a greater or less degree to iron therapy. The term "hypochromic anaemia" is, however, used in this paper to signify a certain group of cases. The blood picture is characterized by a low colour index, hypochromia and microcytosis in the stained film, and a low mean corpuscular haemoglobin concentration. The number of white blood corpuscles is at or below the normal level. In the absence of treatment the course of the anaemia is chronic or torpid; the reticulocytes are within normal limits, and there is no spontaneous recovery. In the absence of complications such as fever, sepsis, cancer, nephritis, or pronounced arteriosclerosis, iron therapy causes the blood picture to return to normal provided it is adequate and, if necessary, prolonged. In one of its purest forms hypochromic anaemia is found in women of the child-bearing epoch, and is commonly associated with achlorhydria or hypochlorhydria. This syndrome has been very fully described in the literature as idiopathic hypochromic anaemia or chronic microcytic anaemia (Faber, 1913; Witts, 1930; Waugh, 1931; Minot, 1932; Dameshek, 1933). Quite frequently chronic blood loss or dietetic inadequacy are believed to be aetiological factors. Heath (1933) found that of eighty-four cases responding to iron 93 per cent. were idiopathic in association with reduced gastric acidity, or were associated with chronic haemorrhage or dietary deficiency. It is this group of cases in an uncomplicated state which is used for the study of the relation of hypochromic anaemia to iron deficiency.

Iron Exchange of the Body

Examination of the facts of the distribution and exchange of iron in the body lends support to the view that the hypochromic anaemias are the result of a state of iron deficiency in the body. These facts are given in the table. It will be seen that more than half of the iron

Iron Stores and Exchange: Normal Human Approximate		Authority
Total in body	4-4.5 grammes	White House Conference, 1932
Circulating blood	2.44 „	Fullerton et al., 1933
Circulating haemoglobin *	2.31 „	
Liver	0.15-0.25 gramme	Ashby, 1912
Daily Iron Exchange		
Average diet, total	10-20 mg.	Reznikoff et al., 1934
„ „ available	7-9 mg.	Widdowson and McCance, 1936
Poor diet, total	5-10 mg.	Davidson and Fullerton, 1933 and 1935
Faeces	5-20 mg.	Reznikoff et al., 1934
Urine	0.5-1 mg.	Marlow and Taylor, 1934
Haemolysis of effete red cells	80 mg.	Wright, 1934
Iron in bile	0.5 mg.	Henrique and Roland, 1928
Special Sources of Loss in Female		
Menstruation (per month), normal	3.8-78.4 mg.	Baldridge, 1935; Barer et al., 1935; Gillett et al., 1918; Ohlson and Daum, 1935
Iron content in full-term foetus	375 mg.	White House Conference, 1932
Iron secreted in lactation	750 mg.	Fullerton, 1936

* 5 litres of blood, 13.8 grammes haemoglobin per cent., 0.335 gramme iron per cent. in haemoglobin.

of the body is present as circulating haemoglobin. It might be expected, therefore, that a state of iron deficiency would manifest itself as a deficiency of haemoglobin, and that chronic loss of blood would seriously deplete the body's stores of iron. Actually the character of the blood picture in hypochromic anaemia with its low colour index and its low mean corpuscular haemoglobin concentration suggests that the essential fault is a failure of the erythron to produce haemoglobin for the developing red cells, and this blood picture is always associated with conditions which deplete the body of iron. The menstrual drain of blood accounts partly for the preponderance of females which is observed clinically. In men hypochromic anaemia is often associated with chronic blood loss from haemorrhoids.

The supply of iron in the food is very small, and of this only a part is available (Elvehjem, 1932; Widdowson and McCance, 1936), so it is not surprising to find dietary deficiency frequently associated with hypochromic anaemia (Davidson, Fullerton, *et al.*, 1933; Heath, 1933). There is evidence that iron is better utilized when administered to patients with a normal gastric secretion (Heath, 1933; Minot and Heath, 1932) or in an acid-buffered medium (Mettier and Minot, 1931), and these observations fit in with the high incidence of achlorhydria or hypochlorhydria among cases of hypochromic anaemia. The role of pregnancy in producing hypochromic anaemia can be attributed partly to the drain of iron into the foetus and in lactation, not fully compensated for by the omission of menstruation, and partly to the temporary hypochlorhydria (Strauss and Castle, 1932).

In short, the repeated association of hypochromic anaemia with conditions which would be expected to lead to iron deficiency and the specific cure of the anaemia with iron strongly favour the view that the hypochromic anaemias are conditioned by a state of iron deficiency in the body.

Dose in Relation to Iron Need

A rise of 1 per cent. per day in the circulating haemoglobin represents the addition of only 23 milligrammes (1/3 grain) of metallic iron per day to the circulation. If the mode of action of iron is simply to correct the iron deficiency in the body it is difficult to explain why large doses are required. The discrepancy between iron need in the body and the size of the average optimum dose led Schulten (1930) to reject the view (Fullerton, 1934; Heath, Strauss, and Castle, 1932) that iron therapy was effective by virtue of correcting a deficiency. He quoted the possibility of a catalytic (*fermentartigen*) action, although admitting that this explained nothing, and appeared to lean towards the explanation attributed to Elvehjem (Dameshek, 1934) that the large doses were effective in virtue of their supplying by contamination another haemopoietic factor such as copper.

Heath, Strauss, and Castle (1932), however, showed on a number of cases of hypochromic anaemia treated by injections of iron that the iron content of the haemoglobin formed as a result of treatment was roughly equal to the amount of iron injected, or in other words that the utilization of injected iron was 100 per cent. This has been taken (Fullerton, 1934) as establishing the view that the hypochromic anaemias are conditioned solely by a state of iron deficiency, and that iron therapy acts solely in virtue of rectifying a state of iron deficiency. This assumption is not necessarily justified, for the cases observed by Heath, Strauss, and Castle were not treated throughout the whole recovery period by iron injections, and even in the short periods of observation there were significant variations from 100 per cent. utilization. Moreover, it leads to the conclusion that iron and ammonium citrate and Blaud's pill in the average optimum doses are very poorly absorbed from the intestine (Clark, 1932). Brock and Hunter (1937) have recently demonstrated that these iron preparations are very well absorbed, and have shown how big is the discrepancy between retention and utilization.

This latter work has therefore raised again the question, apparently settled by the work of Heath, Strauss, and Castle, why it is necessary to give large doses of iron. If the hypochromic anaemias are conditioned solely by a state of iron deficiency, and iron therapy is effective in virtue of correcting this deficiency, why is it necessary to give doses of iron which lead to the accumulation in the body of a great excess of iron? Why are smaller doses not effective?

Iron Retention and Iron Utilization

In considering the response of the blood to iron reaching the body via the intestine in patients with hypochromic anaemia three selected cases are described because they illustrate different forms of response. The cases are selected from a small series in which the amount of iron retained as a result of a short period of therapy was measured by balance experiments (Brock and Hunter, 1937) and the resultant haemoglobin rise measured. The further course of the patients was observed over a period of two years or more. Haemoglobin was estimated by the Haldane method, using a calibrated standard on which 100 per cent. represented 13.8 grammes of haemoglobin per 100 c.cm. of blood. The iron content or iron

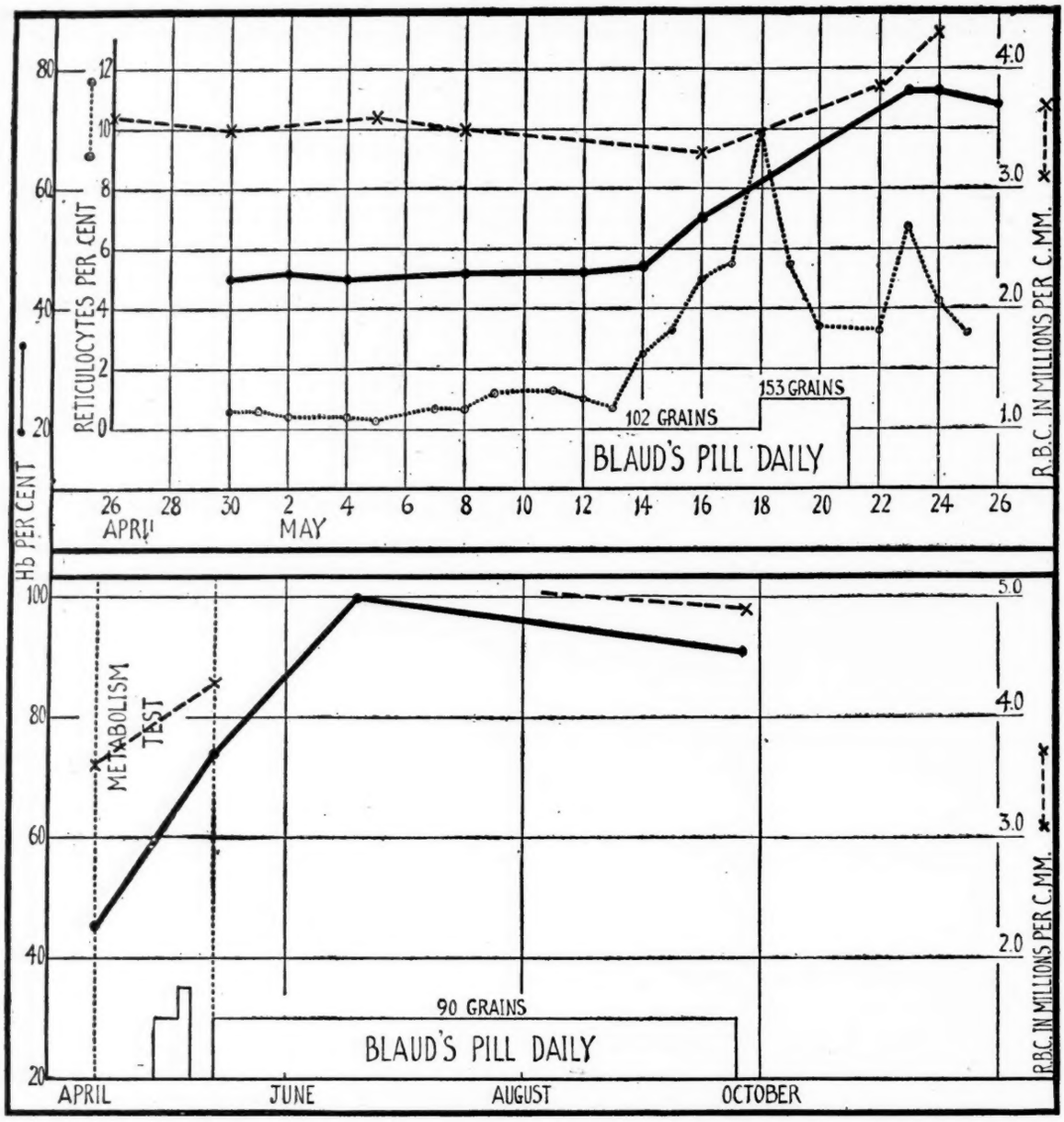

FIG 1.—Case II. In the upper chart is a detailed record of the response of the blood to a brief period of treatment. In the lower chart the patient's subsequent progress is recorded. In the lower chart the period of time represented in the upper chart is condensed on to a smaller scale between the dotted lines. Iron retention, May 12–May 21, was 2,491 mg. Haemoglobin rise, May 12–May 26, was 29 per cent., representing 670 mg. of iron.

equivalent of the newly formed haemoglobin was calculated in each case on a presumed circulating blood volume of 5 litres, using 0.335 per cent. as the iron content of haemoglobin. In this way it was possible to observe the haemoglobin response of patients when the amount of iron actually reaching the body from the intestine was known.

Case I

This was a case of hypochromic anaemia associated with a gastric ulcer, and presumably due to chronic blood loss in the past. The patient was a male aged 17, treated three years before (that is, in 1931) for anaemia. On March 9, 1931, his blood count was: red cells, 3,500,000; haemoglobin, 25 per cent. On March 16, after iron therapy, haemoglobin was 71 per cent. 1934: complaining of epigastric pain and lassitude. *X*-ray examination showed a large lesser curve ulcer. Test meal: free hydrochloric acid, 0.26 per cent.; no occult blood in stools on repeated examination. Red blood count, 5,370,000 per c.mm.; haemoglobin, 62 per cent.; white blood count, 7,700 per c.mm.

The patient's iron balance was measured, and 90 grains a day of Blaud's pill were given for ten days. Of this he retained 639 mg. of iron. He received no further treatment for three weeks. At the end of this period his haemoglobin had risen to 92 per cent. This rise of 30 per cent. would represent 693 mg. of iron added to the circulation if the patient had a blood volume of 5 litres. He was a small individual, however, and the new haemoglobin must therefore have represented an addition of iron to the circulation about equal to the amount of iron retained. When iron therapy was renewed the haemoglobin rose to 110 per cent., and two years later the patient is still well.

Case II

This was a case of idiopathic hypochromic anaemia in a female, single, aged 30. She complained of shortness of breath and pallor for two months. Moderate diet. Catamenia not excessive. No other blood loss. Test meal: no free hydrochloric acid after gruel, but after histamine 0.25 per cent. *X*-ray examination showed no abnormality of stomach or duodenum. Red blood count, 3,460,000 per

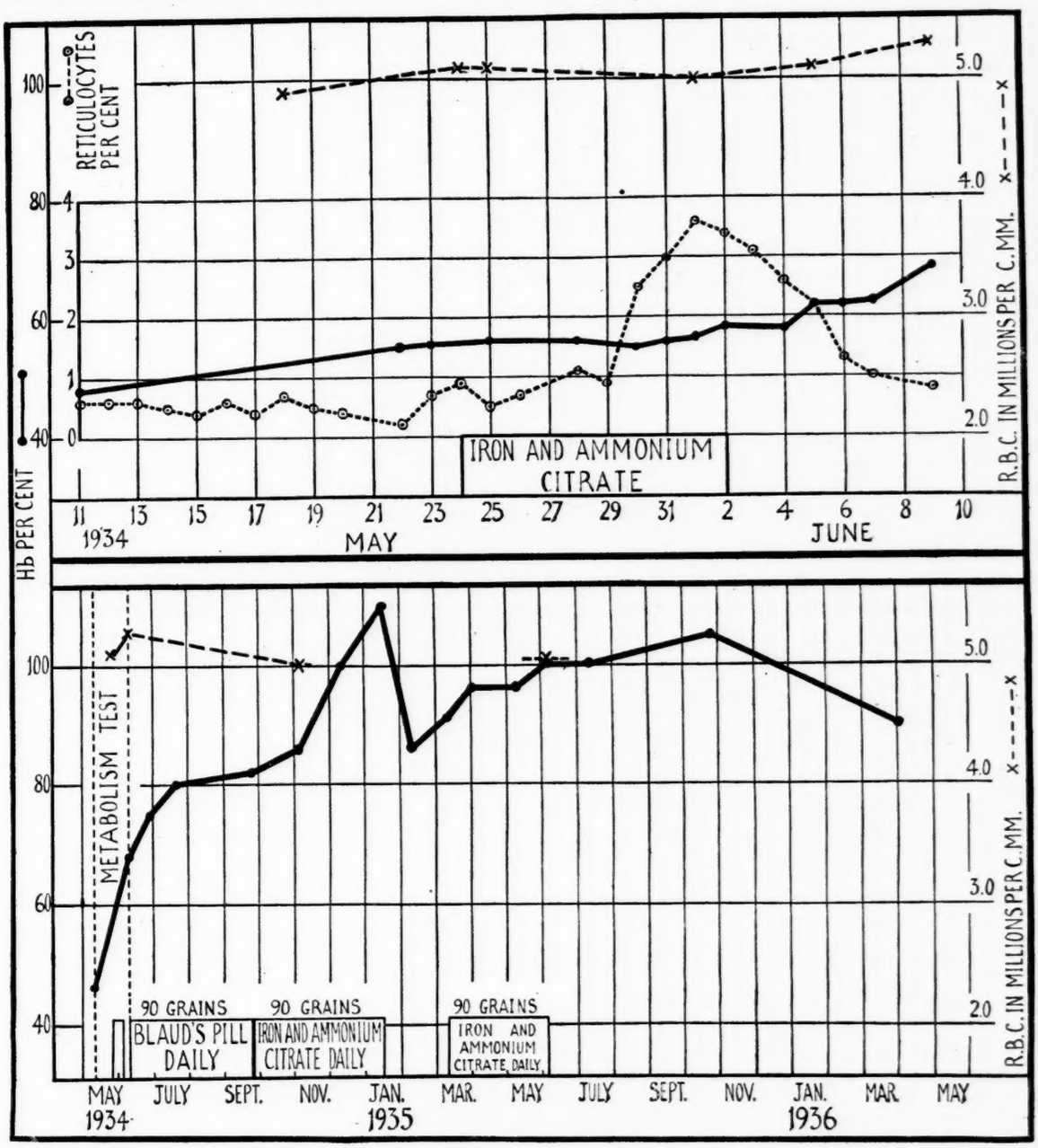

FIG. 2.—Case III. In the upper chart is a detailed record of the response of the blood to a short period of treatment. In the lower chart the patient's subsequent progress is recorded. In the lower chart the period of time recorded in the upper chart is condensed on to a smaller scale between the dotted lines. Iron retention, May 24–June 2, was 1,665 mg. Haemoglobin rise, May 23–June 9, was 13 per cent., representing 300 mg. of iron.

c.mm.; haemoglobin 45 per cent.; white blood count, 3,800 per c.mm. She was given Blaud's mass in gelatin caspules, 102 grains a day for six days and 153 grains a day for a further three days. As a result of this she retained 2,491 mg. of iron, or more than is contained in the whole circulating haemoglobin. The resultant rise of 29 per cent. in the haemoglobin (Fig. 1) represented the addition of 644 mg. of iron to a 5-litre circulation. When iron therapy was renewed the haemoglobin continued to rise, and reached 100 per cent.

Case III

The patient—a case of idiopathic hypochromic anaemia resistant to iron therapy—was a female aged 38, single. Lassitude, pallor, and shortness of breath for two years. Finger-nails brittle. No serious illness in the past. Diet moderately satisfactory. No indigestion. Catamenia not excessive. On examination: well-nourished, pale, with bluish sclerotics; koilonychia. Slight marginal atrophy of mucous membrane of tongue. No temperature. No septic foci. No haemorrhoids. All other systems normal to clinical examination. *X*-ray examination showed no abnormality in stomach or duodenum. Fractional test meal: no free hydrochloric acid after gruel; meal repeated with histamine—free hydrochloric acid 0.15 per cent., total acid 30. No occult blood in stools. Red cells, 4,900,000 per c.mm.; haemoglobin, 55 per cent.; colour index, 0.56; white cells, 5,500 per c.mm. Urine and renal function normal.

Details of her blood are given in Fig. 2. She took 90 grains a day of iron and ammonium citrate for nine days. Of this she retained 1,665 mg. At the end of sixteen days her haemoglobin had only risen 13 per cent., representing the addition of 299 mg. of iron to a 5-litre circulation. She was put on to 90 grains a day of Blaud's pill, but at the end of four months her haemoglobin was only 80 per cent. If only 5 per cent. of the Blaud's pill had been retained, an improbably low estimate (Brock and Hunter, 1937), she would still have retained another 3 grammes in addition to the 1.66 grammes retained in the experimental period. This is twice as much

iron as is contained in the whole circulating haemoglobin. And yet in September, 1934 (Fig. 2), the change from Blaud's pill to iron and ammonium citrate, which doubled the amount of iron in the intestine, was followed by a sharp rise of haemoglobin to 110 per cent. This patient was in no way different clinically from cases of hypochromic anaemia which respond rapidly to iron; she had none of the complications which are recognized as delaying the response to iron, and although she has been under observation for two years since the balance experiment she has remained well. But in 1936 there was a drop in the haemoglobin, in spite of all the excess iron which was stored.

Discussion of Cases

In Case I the haemoglobin increase was a quantitative measure of the amount of iron absorbed and retained by the body, and it can be argued from this case, as from the cases treated by Heath, Strauss, and Castle (1932) with injections of iron, that the anaemia was conditioned solely by the absence from the body of iron available for haemoglobin formation.

In Case II the haemoglobin increase was not a measure of the amount of iron retained. It rose by 29 per cent. in fourteen days, whereas the amount of iron retained by the body in nine days of treatment would have allowed it to rise to more than 100 per cent. if the iron had been fully utilized for haemoglobin formation. We do not know the maximum possible rate of haemoglobin formation. The highest rate recorded by Fullerton (1934) in periods varying from twenty-five to forty days after the inception of treatment was 2.88 per cent. per day. In one case which I studied intensively the haemoglobin rose 34 per cent. in twelve days (2.8 per cent. per day) following the commencement of iron therapy, when iron balance had shown that sufficient iron had been retained to allow of an even greater rise.

In Case II the iron retained was enough to allow the haemoglobin to rise by more than 7 per cent. per day during the first fourteen days. It can be said of this case that the rate of regeneration of the haemoglobin was limited by some factor other than the rate at which iron could be introduced into the body, but that it was so satisfactory that there is no reason to believe that the anaemia was conditioned by any factor other than a deficiency of iron.

In Case III the rate of haemoglobin regeneration was quite clearly unsatisfactory. During the first sixteen days her haemoglobin rose only 13 per cent., which is below the accepted standards of satisfactory response (Fullerton, 1934; Heath, 1933), and thereafter the rate of recovery steadily declined in spite of the fact that during the first nine days of iron therapy alone enough iron was retained to allow the haemoglobin to rise to 100 per cent.

It is difficult to define accurately what is the lower limit of a satisfactory response to iron therapy. Heath (1933) has suggested as a rough working rule a rise of at least 1 per cent. per day when the initial haemoglobin is below 70 per cent. Without defining the limits any more accurately it is plain that the response in Cases I and II was, and in Case III was not, satisfactory.

Efficacy of Excess Iron

How do these three cases fit in with the theory that the hypochromic anaemias are conditioned solely by a deficiency of iron available for haemoglobin formation? Case I is in line with the results of Heath, Strauss, and Castle, and supports the thesis. On the other hand, Case III is an extreme example of failure to respond in the presence of enough iron. The amount of iron retained by this patient in the first ten days of treatment (Fig. 2) was enough, if fully utilized, to allow her haemoglobin to rise to 100 per cent., but this result was only achieved after amounts of iron had been given in the next six months which must have led to the accumulation of a great excess in the tissues. The amounts of iron in question, moreover, were too great to allow of the explanation that some of the retained iron was stored in other iron-hungry tissues (see Table), and hence was not available for haemoglobin formation. Resistant cases of this sort have in the past been attributed to failure to absorb iron. It is now apparent that this explanation is inadequate, and it must be allowed that certain cases of hypochromic anaemia do not recover when iron has been absorbed into the body in amounts sufficient for haemoglobin formation.

Case II presents another aspect of the problem. Here the haemoglobin response was satisfactory, and it might be thought that the dose of iron was unnecessarily large. But in Fig. 1 it appears that the haemoglobin rise began to tail off between May 23 and 26 after the cessation of therapy, in spite of the fact that enough iron had already been retained to allow it to rise to 100 per cent. The haemoglobin rise was renewed when iron therapy was instituted again. If this observation is correct, then even in cases which respond satisfactorily and when iron absorption is rapid an *excess* of iron may be more effective than *enough* iron. This single observation could not be accepted in itself, but it is strongly supported by the large discrepancy demonstrated by Brock and Hunter (1937) between the figures for iron utilization and those for iron retention when the preparation is taken by mouth in the average optimum doses. It is supported also by the sort of case reported by Schulten (1930), in which 2 grammes of reduced iron had no effect, while 6 grammes produced a prompt response in the blood picture. Schulten's experience can be confirmed by anyone who has treated a large series of cases of hypochromic anaemia, and has been commented on by other writers (Dameshek, 1934; Heath, 1933; Witts, 1933).

In view of the figures for iron retention published by Brock and Hunter (1937) it is no longer possible to assume that the large doses are necessary in order to get *enough* iron into the body. Such cases are strong evidence that *excess* iron may be more effective than *enough* iron. It might be argued that there is a sort of mass action in the intestine, and that no iron is absorbed at all until large doses are given. There is, however, no evidence of mass action in the figures supplied by Brock and Hunter, and Reimann and Fritsch (1931) have shown by balance experiments that small doses of iron are readily absorbed.

In short, it may be said that Cases II and III, supported by a considerable body of corroborating evidence, suggest that large doses of iron which lead to the accumulation of a great excess of iron in the tissues are more effective in certain cases of hypochromic anaemia than are smaller doses which allow of absorption of enough iron for haemoglobin formation. It is this mysterious efficacy of large doses which is the baffling problem of the relation of the hypochromic anaemias to iron deficiency.

Soluble Ferrous Preparations

Up to this point the argument has been simplified by omitting all reference to recent work on the use of small doses of soluble ferrous preparations (Davidson, 1933; Fullerton, 1934; Heubner, 1924 and 1926; Lintzel, 1931; Reimann and Fritsch, 1933; Starkenstein, 1926; Starkenstein and Weden, 1928; Wagner, 1931). It has been

claimed that these are efficacious in smaller doses than can be used in the case of the preparations referred to above. The claim is justified only in part. Reimann and Fritsch (1931) have shown that small doses of ferrous chloride are very readily absorbed and retained (up to 53.8 per cent. of the amount administered). This means that a daily dose of 9 grains ferrous sulphate exsiccatus, if it is absorbed anywhere near as readily as ferrous chloride, would allow the body to retain enough iron for an optimal haemoglobin response and a margin for replenishing reserves. But in spite of this Fullerton (1934) found that only ten out of twenty-one cases had a satisfactory haemoglobin response on this dose. So that even with the soluble ferrous preparations the anaemia apparently does not always respond to the provision of *enough* iron.

There has been a tendency to put 9 grains of ferrous sulphate exsiccatus on a par with 90 grains of Bláud's pill as an average optimum daily dose. Such a claim cannot be accepted. Favourable cases (ten out of twenty-one in Fullerton's experience) will respond to 9 grains of ferrous sulphate; but they will also respond to 30 grains daily of Blaud's pill, which contains about the same amount of iron. Sixty to ninety grains of Blaud's pill is an average optimum dose which will cause a satisfactory remission in all but the most resistant cases, and the equivalent dose of ferrous sulphate exsiccatus is probably about 18 to 27 grains. There is no reason at all why the iron of ferrous sulphate exsiccatus should be better absorbed than that of freshly prepared Blaud's pill, and indeed there is no evidence of a difference in utilization as between the two preparations in Fullerton's Table III (1934).

Mode of Action of Large Doses of Iron

The purpose of this paper is to present the evidence for the greater effectiveness of *excess* iron as compared with *enough* iron, not to explain it. Any attempt to do so involves us in the present state of knowledge in pure speculation. Recent work on the potentiation of iron as briefly reviewed by Witts (1936) may have some bearing on the problem. Two possible explanations will be outlined as exemplified in Case III, but it must be insisted that they are highly speculative and that there is at present no real evidence in support of either of them.

One is that the iron and ammonium citrate administered in November (Fig. 2) contained copper which was needed by the individual, whereas the Blaud's pill previously given contained no copper. It is still claimed by some workers (Dameshek, 1934; Mills, 1930) that copper is effective as an adjuvant to iron in certain cases, although their experience has not been generally confirmed, and Davidson (1933) has given reasons for believing that the modern adult never suffers from copper deficiency.

The other possible explanation is that the presence of large amounts of iron in the intestine *per se* has some effect. It is significant that so soon as iron therapy was omitted in Case III (Fig. 2) in January, 1935, the haemoglobin immediately dropped from 110 to 86 per cent. The presence of large quantities of iron in the intestine must change conditions there very markedly. It alters the bacterial flora (Lotze, 1933) and interferes with the absorption of other minerals (Brock and Diamond, 1934; Brock, 1937; Waltner, 1927). It is conceivable that it might aid the absorption of other substances necessary for haemopoiesis. There are still many unexplained features in the relation between achlorhydria and the hypochromic anaemias. It has been shown that the haemoglobin and reticulocytes respond better to a given dose of iron in the presence of a normal gastric secretion (Heath, 1933) and when it is given in an acid-buffered meat mixture (Mettier and Minot, 1931), but there is still no proof that iron is better absorbed under these conditions. Recent work by Mettier, Kellogg, and Rinehart (1933) is interpreted by them as indicating that the absence of pepsin in cases of achlorhydria prevents them from freeing iron from its organic combinations in food. But it is apparent that the new-formed haemoglobin in their cases contained more iron than had been contained in the whole of the predigested meals administered, so if their observations are correct they must mean that some additional factor necessary for haemopoiesis had been formed under the influence of peptic digestion.

It is at least conceivable that the presence of large quantities of iron in the intestine, by altering the chemical environment, increases the absorption of some undetected haemopoietic factor which is necessary in iron-resistant cases. The final rise of haemoglobin in Case III which occurred in November, 1934 (see Fig. 2), followed on the doubling of the amount of iron in the intestine of a patient whose body was already saturated with iron. It is possible that the relation between these two events was really *propter hoc* instead of just *post hoc*. This suggestion is, however, only a hypothesis for which there is no real evidence at all, and it must be frankly admitted that there is at present no rational explanation of the value of large doses of iron.

Rational Iron Therapy

It is clearly established that the hypochromic anaemias are conditioned mainly, if not solely, by a state of iron deficiency, and that they cannot respond properly to any form of therapy which does not supply enough iron to be incorporated in the new haemoglobin. A satisfactory response to iron is a rise of haemoglobin of from 1 to 2 per cent. per day, which represents the addition to the circulation of from 23 to 46 mg. of iron. The administration of this amount by any form of injection, even when given every day, is an extremely uncomfortable and even dangerous procedure for the patient (Heath, Strauss, and Castle, 1932). The well-known preparations on the market of iron for injection contain less than 3 mg. per dose, and their use in anaemia is ridiculous. Even injectio ferri *B.P.* is entirely inadequate (Burger and Witts, 1934). It can be said to-day that there is never any indication for injections of iron in the treatment of anaemia.

In some cases of hypochromic anaemia all that is required is sufficient iron by mouth to supply about 50 mg. daily for new haemoglobin and an undetermined but probably smaller amount for the replenishment of other tissues in the body which have become iron-deficient.

Another group of hypochromic anaemias appears to respond only when iron is given in doses which lead to the accumulation in the body of amounts up to 200 mg. per day (Brock and Hunter, 1937). There is at present no rational explanation of the necessity for such large doses. Their use is empirical, but their value is very well attested in clinical experience (Dameshek, 1934; Heath, 1933; Schulten, 1930; Witts, 1933). It is important to note that there is no way of distinguishing clinically between those cases in which small amounts of iron are adequate and those which require larger doses. It is advisable, therefore, to have an average optimum dose for the benefit of practitioners who have to treat patients without facilities for frequent haemoglobin estimations. The average optimum dose of iron and ammonium citrate is 60 to 90 grains a day, and of Blaud's pill 45 to 90 grains

a day, as judged by clinical experience with large series of cases (Dameshek, 1934; Heath, 1933; Witts, 1933). There is no reason to believe that tablets of ferrous sulphate or ferrous chloride are any better absorbed than is the iron in freshly prepared Blaud's pill, so that they should be given in doses containing the same quantity of iron—for example, 15 to 30 grains daily in the case of ferrous sulphate exsiccatus. Many cases will respond to smaller doses just as they will to doses of Blaud's pill smaller than 45 grains daily, but, as has been shown, there is no way of distinguishing clinically between those needing small and those needing large doses. Fullerton (1934) found that only ten cases out of twenty-one responded satisfactorily to ferrous sulphate exsiccatus in a dose of 9 grains daily.

Various preparations of soluble ferrous salts are being put on the market which, because of their smaller bulk, will probably replace the familiar Blaud's pill. But whatever the preparation there must be a reasonable assurance that the iron will remain in a ferrous state, and they must be given in a dose which contains a minimum of 300 mg. of metallic iron daily. Tablets of ferrous sulphate as made by Glaxo appear to fulfil these requirements, and are very convenient and palatable. The dose of 9 grains per day, however, which is frequently recommended, cannot be regarded as an average optimum dose. About 50 per cent. of cases will respond adequately (Fullerton, 1934), but unless frequent haemoglobin estimations are being performed the dose should always be at least 15 grains a day, and may have to be larger. If ferrous chloride is being used in a syrup solution, as recommended by Witts (1936), an average optimum dose varies from 9 to 18 grains a day at least (300 mg. of metallic iron), according to whether the ferrous chloride is anhydrous or not.

In resistant cases the dose should always be raised to the maximum before despairing of iron, and since there are still many unexplained factors in the aetiology of hypochromic anaemia a diet rich in first-class protein and vitamins should always be insisted on.*

During the three years in which the experiments here referred to were being conducted the writer held successively the Leverhulme Research Scholarship of the Royal College of Physicians and the Walter Dixon Scholarship of the British Medical Association. He has pleasure in expressing his indebtedness to Dr. George R. Minot for the impetus to undertake the work, and to Dr. Donald Hunter and Dr. J. M. Vaughan for help and advice.

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* Since the publication of the work of Brock and Hunter (1937) on the absorption of large quantities of iron my attention has been drawn to a note by Fowler and Barer (1935) indicating that they have obtained similar results by balance experiments.

J. P. Strömbeck (*Nord. med. Tidskr.*, December 5, 1936, p. 1996) finds from a study of the literature that opinions are still divided as to the merits of the excision and suture of recent wounds as advocated for the first time by Friedrich in 1893. The author has therefore tried to throw light on this treatment, which has been applied since 1928 at the Serafimer Hospital in Stockholm to wounds accidentally inflicted. Since September, 1932, records have been kept with special reference to the nature of the wounds according as they were inflicted by cutting or blunt objects, or were associated with suppuration, necroses, haematomata, reopening of the wound, and other complications. In the course of three years about 3,000 cases were treated, approximately three-quarters of the patients being males. In nearly every case the injuries did not entail residence in hospital, and those cases were excluded from the analysis in which compound fractures of the long bones had occurred or in which the wounds were very deep and extensive. The treatment consisted in washing with a soap solution and then with alcohol after local anaesthesia had been induced. The walls and floor of the wound were then excised to a depth of one millimetre. Before, during, and after this excision the wound was irrigated by a solution of chloramine. Ligatures and sunk sutures (except tendon sutures) were avoided as much as possible, and silk was employed for the skin sutures. The author's findings are reproduced in several tables in which information is given about the character and site of the injuries and various other data. The author's conclusion is favourable to this procedure, which he does not, however, recommend unreservedly in general practice. It is most suitable for hospital practice, and even here care must be taken in the after-treatment lest secondary opening of the wound ensue.

TREATMENT OF GONORRHOEA WITH A SPECIFIC ANTITOXIN

BY

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Since the earliest days of medical therapy it is no exaggeration to say that the world has awaited a specific remedy for the treatment of gonorrhoea. All attempts to discover a drug having a specific action, either direct or indirect, upon the gonococcus have failed, and the biological remedies hitherto produced have been equally ineffective.

Urged by Professor E. Mellanby at the beginning of February, 1934, to investigate a new biological approach in conjunction with Dr. Mervyn Gordon, our researches were then directed towards the production of a gonococcal antitoxic serum along the lines which had proved so successful in Gordon's hands for the preparation of anti-meningococcus serum. The two organisms have many points in common. Although their cultural characteristics and pathogenicity to animals are distinctly different, the meningococcus and the gonococcus resemble each other in their microscopical appearance, the negative reaction to Gram's stain, their intracellular habitat within the leucocytes, and the agglutination by identical specific sera, the absorption test being necessary to distinguish them.

Earlier Work

Serum treatment in gonorrhoea is not new. Previous work on these lines, however, has been confined almost entirely to the use of anti-bacterial sera prepared by immunizing animals with cultures of the living organism. The position was well summed up by Minet and Debains (1923) at the Congress of Urology, that "unfortunately, we know little about gonococcal toxin, and we do not know yet how to prepare an exclusively antitoxic serum—we are only aware of an anti-microbic serum, prepared at the Pasteur Institute by M. Nicolle." Clinical reports have shown that such a serum is helpful, but that it falls far short of being a specific remedy. Our investigations had not proceeded very far when our attention was drawn to the successful results obtained by Dr. N. S. Ferry (of the Parke Davis Research Laboratories, U.S.A.) in the production of a soluble toxin from the gonococcus by a method he had used in the preparation of a meningococcal toxin. Ferry, with Clark and Steele, had published a paper on the properties of a bouillon filtrate of the gonococcus. After reviewing previous works on the subject, the most important of which would appear to be the development of sera by de Christmas (1897), Herrold (1925), Herrold and Traut (1927), and Herrold and Hoffman (1930), the authors describe the method evolved in producing the filtrate, and express the view that it exhibited properties which seemed to characterize it as an extracellular toxin. It was found that the toxin was capable of producing skin reactions similar to the Dick reaction in dilutions of 1 in 1,000 and 1 in 1,500. Furthermore, the injection of animals with this toxin stimulated the formation of an antitoxin which neutralized *in vitro* as well as *in vivo*. Repeated subcutaneous injections of increasing doses of filtrate stimulated the formation of antisera with properties unmistakably antitoxic in nature, a characteristic which was evidenced by the fact that antisera prepared from both rabbit and horse neutralized the toxic properties of the filtrate.

Sensible of the possible advances to be achieved by the use of such a soluble gonococcal toxin for the production of an antitoxin to be used in the treatment of gonorrhoea, Parke, Davis and Co. were approached through Dr. Stanley White, their medical representative in this country, in regard to the preparation of a gonococcus antitoxin for clinical trial. Using a method practically identical with that devised by him for the production and standardization of meningococcus antitoxin, Dr. Ferry prepared an unconcentrated gonococcus antitoxin. This was later concentrated by the Banzhaf method, which leaves the antitoxic potency in the pseudo-globulin fraction, a point which Ferry considers supports the evidence in favour of the product being a true antitoxin.

The antitoxin was placed in my hands by the courtesy of Parke, Davis and Co. through the kindness of Dr. White, to whom I am also indebted for assistance, not only on the laboratory side, but also in the subsequent clinical investigation.

Preliminary Trials

Initial trials were made with an unconcentrated antitoxin on complicated cases, both acute and chronic, chosen for their severity as being a more rigorous test. As the dosage and reaction were unknown its use was restricted to in-patients. It was at once noticed that the antitoxin appeared to be exerting a specific effect. The average daily dose of this unconcentrated antitoxin was found to be 5 to 20 c.cm. when injected intramuscularly. Even with these small doses caution was necessary, as in some cases severe reactions occurred. The beneficial results, however, were beyond question, and it was found possible, even after severe reactions, to repeat the injection twenty-four or forty-eight hours later.

After these preliminary trials a request was made for a concentrated antitoxin from which much of the extraneous protein had been removed. This was kindly supplied to me with the information that theoretically it should prove five times more potent than the unconcentrated product. In practice this proved to be the case. In no instance was it necessary to administer more than 8 c.cm. of this concentrated preparation at one time, and in most cases 5 c.cm. appears to constitute a maximum dose. The average dose was found to be 1 c.cm. intramuscularly; doses of over 2 c.cm. in many cases caused severe systemic disturbance. Later a routine procedure was adopted of injecting adrenaline simultaneously and mixed with the antitoxin. It appears advantageous to inject the adrenaline with the serum rather than to administer it separately. Three minims of adrenaline chloride solution 1 in 1,000 were given with 1 c.cm. of the concentrated antitoxin; four minims with 2 c.cm.; and five minims with 3 c.cm. In this way the reactions have been controlled to such an extent that it has been possible to treat out-patients with this concentrated antitoxin.

A surprising feature was the comparatively small amount of antitoxin necessary, particularly when one considers the comparatively large doses of meningococcus antitoxin which are essential to combat meningococcal infections, until Gordon suggested that almost certainly both an active and a passive immunity were being obtained.

The question of a reaction attributable to some reason other than a specific effect, such as the protein content of the serum, was investigated. To obtain satisfaction on this point a series of controls with normal horse serum was carried out. In no instance had the serum any influence on the infection or the patient; neither did it cause reactions of any kind, nor was temperature or respiration disturbed.

Clinical Results

The following data refer to 157 male patients treated with the gonococcus antitoxin, and these may be separated into:

Acute uncomplicated cases	42
Acute complicated cases	84
Chronic complicated cases	31

The acute complicated cases included: epididymitis, 37; arthritis, 27; vesiculitis, 8; prostatitis, 6; conjunctivitis, 3; iritis, 2. The chronic complicated cases were: epididymitis, 14; arthritis, 11; prostatitis, 4; vesiculitis, 1; iritis, 1.

It is extremely difficult to summarize the clinical results of such an erratic disease as gonorrhoea. Some cases were obviously more severe than others, and the resistance of the patients varied considerably; but even so the following may be taken as a fair indication of the percentage of successes or otherwise of the antitoxin treatment: excellent, 49.6; good, 26.9; fair, 14.8; bad, 5.9. Clinical relapses occurred in only 6.6 per cent. in this series.

The duration of times mentioned in this paper indicating the periods in which a "cure" or some clinical improvement was attained should not be taken too literally or criticized too severely. Times have been mentioned so that the reader may form an approximate evaluation of the results obtained. The times required to effect a cure in gonorrhoea are subject to so many varying factors, more especially the personal equation of the assessor, that they are seldom published; for who is bold enough to state *precisely when* a gonococcal infection is cured? My tests of cure have been described elsewhere. They are extremely rigid, and a certain period of time, varying according to the type of case, must elapse while they are being applied. In evaluating a cure it is the method in which the disease retrogresses, pathologically as well as clinically, on which the expert mostly relies. Careful notes and the results of the chronological series of pathological findings reveal the evolution of the process of cure, and are more valuable than a single set of tests applied on one day only. Hence a fair estimation of when an infection ceased is most accurately obtained by scrutinizing the case record after the patient has been under observation and tests for a prolonged period. In this investigation, although some "defaulted," each patient was kept under observation as long as possible; no case was discharged at the earliest moment.

Acute Gonorrhoea, Uncomplicated

Dysuria, irritation, and discomfort subside earlier than usual. The patients commonly declare how well they feel, and express their belief in the efficacy of the injections, as they "feel much better for them."

An analysis of the thirty-six cases that completed the tests of cure and were observed for at least three months shows that a "cure" was effected in two cases in sixteen days; one case, nineteen days; four cases, three weeks; twelve cases, four weeks; five cases, five weeks; seven cases, six weeks; and in five cases, eight weeks.

In a week even the uncomplicated cases of acute gonorrhoeal urethritis have given rise to dissemination of gonococci through the blood stream, although this may not be apparent. If the antitoxin is given early enough, however, complications such as posterior urethritis, vesiculitis, prostatitis, epididymitis, and arthritis seem to be prevented. Among the total of forty-two cases only three relapsed or developed a complication.

In one case the urethritis ceased on the fifteenth day, but recurred slightly on the twenty-first day, although the patient had received fifteen daily doses of 1 c.cm. of the concentrated product. The second case developed a tenosynovitis of the right wrist four weeks after 45 c.cm. of the unconcentrated antitoxin, the dosage being 10, 15, and 20 c.cm. on three successive days.

Epididymitis

In general, complete relief from pain is obtained in twenty-four to forty-eight hours, and occasionally a sudden and astonishing cessation of pain in five to six hours, accompanied by a rapid decrease in swelling. Several patients discharged themselves from hospital within five or six days because "they felt so well." It is also worth recording an experienced and impartial observer's note in one case twenty-four hours after the first injection of 10 c.cm. of unconcentrated antitoxin—namely, that he had "never seen such a rapid and marked improvement before."

An analysis of forty-two cases indicated that one patient was "cured" in sixteen days; four in twenty-one days; one in twenty-three days; one in forty days; one in forty-five days; seven in four weeks; six in five weeks; three in six weeks; one in seven weeks; seven in eight weeks; three in ten weeks; five in twelve weeks; one in fourteen weeks; and one in sixteen weeks. Among fifty cases only one relapsed.

This patient had a bilateral vesiculitis with a left epididymo-orchitis of two months' duration. He then received only 6 c.cm. of the unconcentrated antitoxin, 1, 2, and 3 c.cm. on three successive days, and developed a right epididymo-orchitis four weeks later.

Arthritis

Patients under this category, "arthritis, acute and chronic," include the conditions arthritis with effusion, fasciitis, and tenosynovitis. The time required to obtain "*nil* abnormal" clinically and pathologically in urine, vesicles, prostate, and urethra (all tests being pathologically clear except for an occasional positive gonococcal fixation test) was as follows: in acute cases, eight in four weeks; six in six weeks; one in seven weeks; two in eight weeks; two in ten weeks; two in twelve weeks; one in twenty-four weeks; and one in forty weeks. In chronic cases, one in three weeks; one in five weeks; three in six weeks; two in eight weeks; and one in nine weeks.

The clinical results are rapid in recent acute cases, pain and swelling ceasing in a few days, sometimes after the first injection. Generally the joint appears normal, has full mobility in a week, and the result is permanent.

For example, a severe case of acute gonococcal arthritis complicated with a bilateral epididymitis, and a very painful arthritis of both knee-joints, tense with fluid, had regained normal movement in both knee-joints on the fifth day; pain was absent and very little fluid remained. In fifteen days this patient was normal clinically and discharged from in-patient treatment.

Similarly with the chronic cases. Generally the patients are able to walk or to use arms or hands without disability, and to leave hospital within eighteen to twenty-one days instead of the usual five to six weeks. In most cases relief from pain occurs within thirty-six to forty-eight hours, with rapid diminution of the effusion and increased mobility of the joint. In one chronic case with four years' history, where a cure was effected after six weeks, the patient made the observation that he had had "no pain, and had not been so comfortable for months." Another case of arthritis, also of four years' duration, was "cured" in nine weeks. All cases recovered

completely, even those which temporarily relapsed. No disability or ankylosis remained in any single case.

Three acute cases relapsed. The first, an acute arthritis of the left knee, improved, but relapsed four weeks after 6 c.cm. (1, 2, and 3 c.cm.) of the concentrated serum. The second, a severe polyarticular case in which both ankles, wrists, and the right knee were involved, improved temporarily with 6 c.cm. (1, 2, and 3 c.cm.) of concentrated serum, but four weeks later a slight effusion returned in the knee-joint, although the other joints had recovered. The third, an acute urethritis of three weeks' duration, had an effusion in both wrists and knee-joints. Initial improvement followed 20 c.cm. (2, 3, 5, and 10 c.cm.) of the unconcentrated serum, but the fluid returned in the left wrist ten days after the last injection. The focus was in the right vesicle.

One chronic case of seventeen years' duration relapsed. It was particularly severe, being complicated by an acute epididymo-orchitis, iritis, bilateral vesiculitis, and prostatitis. Two months after 78 c.cm. of the unconcentrated antitoxin had been given an effusion developed in the knee-joint. After a second series of injections (20 c.cm.) no relapse occurred over a period of nine months' observation.

Reactions

No fatality has occurred among the cases treated. All the reactions, of whatever type and degree of severity, have been transient and left no permanent disability. Provided the dosage does not exceed 15 to 20 c.cm. in the case of unconcentrated antitoxin, and 3 to 4 c.cm. in the case of the concentrated antitoxin, the reactions are not alarming or more marked than those caused by the sera commonly used in other infections.

Urticarial serum rashes develop earlier with the concentrated than with the unconcentrated antitoxin, generally within three days after the last injection, instead of within four to ten days with the unconcentrated preparation. With the concentrated product the rash is more transient, and generally localized to the buttocks. With the unconcentrated serum the rash has been more generalized about the trunk and limbs, and takes longer to disappear.

The duration of the rash with the unconcentrated product was as follows: in two patients, one day; in one patient, two days; in one patient, three days; in three patients, four days; in three patients, five days; and in one patient, six days. In four patients the rash developed one day after the last injection; in three cases, two days; in nine cases, three days; in two cases, four days; in three cases, five days; in one case, seven days; and in one case, ten days. In ten cases the rash appeared on the buttocks.

Serum sickness occurred in five cases; two of these had no other signs of a serum reaction. Stiffness in the shoulders, headache, rigors, pain in the back and joints or in the limbs were also reported. "Thermal reactions" due to the serum were also experienced in fourteen patients in a series of 112 cases. Two developed a sore throat with an accompanying pyrexia of 103.6° in one case and 103° in the other. In both cases the pyrexia and sore throat had subsided within twenty-four to forty-eight hours, and were not septic in character.

Apart from the customary reactions already enumerated, certain additional phenomena, including some types of pyrexia to be mentioned later, provide additional evidence of specific action. A period of approximately five hours after an injection seems of peculiar significance in all types of case, both acute and chronic. About this time the following phenomena have been experienced by different patients: sudden cessation of pain, "collapsed feeling," rapid pulse and pyrexia, rigors, profuse perspiration, transient nausea, and faintness.

At this time one case of salpingitis with a temperature of 102.2° felt "as if she had been doped," and then lapsed into a deep sleep. When she woke ten hours later both pain and pyrexia were absent, and remained so. Another patient with a gonococcal septicaemia and a bilateral salpingitis had a sudden rise of temperature from 101° to 104° during this five-hour period. Then she complained of pains in the body and limbs, and became delirious for three hours.

One out-patient with acute uncomplicated urethritis who had received 1 c.cm. of the concentrated antitoxin daily for seven days, on the eighth day experienced a mild rigor, which was followed directly after by a profuse macular rash covering both legs up to the knee-joint. Independent observers agreed that this was not a typical serum rash; it had no urticarial characteristics, and did not irritate. The only possible conclusion was that the patient was experiencing a gonococcal skin reaction, which, although rare, has been noted by me on occasion. This again is supportive evidence that the antitoxin has a specific effect. Incidentally, before this occurred all signs and symptoms of a gonococcal infection had disappeared.

Pyrexia

Analysis of the temperature charts of sixty in-patients separates naturally into three groups; two types of pyrexia confirming the specific reaction of the antitoxin, and a third apyrexial class.

(*a*) A specific pyrexial reaction rising progressively (Fig. 1) as the injections proceed, but dropping to normal directly

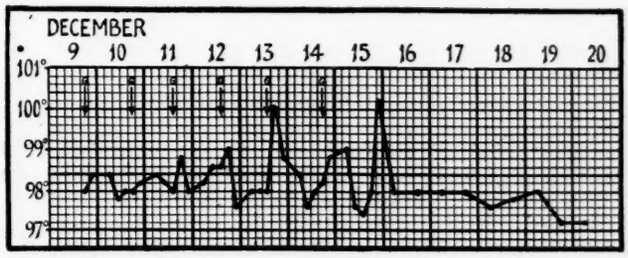

FIG. 1.—An uncomplicated gonococcal urethritis.
G = Gonococcus antitoxin 2 c.cm.

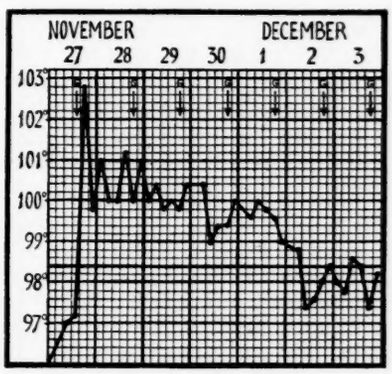

FIG. 2.—An acute gonorrrhoeal urethritis complicated by prostatitis, a right-sided vesiculitis, and a right-sided epididymo-orchitis.
G = Gonococcus antitoxin 2 c.cm.

the administration of the antitoxin ceases, and remaining normal (except for serum thermal reactions), occurred in forty-four patients.

(*b*) A specific pyrexia falling (Fig. 2) after the first injection gradually and progressively, as the injections proceed, to normal, and remaining normal (except for serum thermal reactions), occurred in twelve cases.

(*c*) The temperature remained normal during the administration of the injections in four cases.

At this point the cause of these reactions may be discussed. Several possibilities emerge. One, that the gono-

coccus is a delicate organism easily destroyed, possibly with the liberation of toxin. If this is the explanation then the patient may be experiencing a toxaemia as the result of auto-inoculation, further doses resulting in a complete neutralization. Or the gonococcus antitoxin may possess some residual toxin which, circulating in the serum of the horses, is contained in the antitoxin.

It may be that some of the reactions are due to impurities in the toxin used in the preparation of the antitoxin. I have been unable to obtain evidence that the reactions are due to protein in the antitoxin. In order to demonstrate this point a series of controls were carried out on in-patients in the same ward under identical conditions, first with a natural horse serum, and secondly with a concentrated horse serum of the same concentration as the concentrated gonococcus antitoxin. In no instance did the serum influence the infection or the patient, nor was there any evidence of pyrexia or other reaction. These controls were also important in demonstrating that the effects which were obtained with the antitoxin were presumably specific and not to be ascribed to "protein shock." Again, variations in the type or strain of gonococcus may affect these reactions, and patients may vary in reaction to the antitoxin according to the resistance they may possess individually against the infection. Possibly the patients in group (*a*) have a poorer resistance than those in group (*b*). It has to be admitted that it is not yet possible to explain all the different phenomena and types of reaction that have occurred; but clinically it seems certain that an active as well as a passive immunity is established.

Discussion

At the time of writing a total of 789 injections have been administered to 178 cases. Early in the investigation 3,090 c.cm. of unconcentrated gonococcal antitoxin, and later 452 c.cm. of concentrated gonococcal antitoxin, have been given intramuscularly or deep-subcutaneously. Hitherto I have hesitated to give the antitoxin intravenously, but more satisfactory results should be obtained by this route. The results obtained with the concentrated antitoxin have been, if anything, better than those treated with the unconcentrated product.

When treating out-patients it was essential to avoid reactions so far as possible, and more recently the dosage has been restricted to 1 c.cm. of the concentrated product daily. Patients have received 1 c.cm. each day over the period of a fortnight, and clinically appeared to be cured. Obviously the term "cured" cannot be employed until the patients have been subjected to exhaustive clinical and laboratory tests. There is always the disadvantage that the out-patient may not follow the instructions which have been given to him, so that in many ways the use of the antitoxin in the out-patient department is a more severe test than when the patient is in hospital under supervision. Treatment is further complicated by the varying resistance of the patients to the infection, which may, for instance, be good, medium, or poor, so that it is not possible to be definite in regard to dosage. Various schemes of dosage have been on trial, and although in one case as much as 100 c.cm. of the unconcentrated antitoxin was administered, my limited experience indicates that too large a dose is a mistake. It is better to give small doses regularly than large doses occasionally. In most cases the best results seem to be obtained when the injections are given daily in small doses of 1 to 2 c.cm. of the concentrated antitoxin, not increasing the dose as the injections proceed, but maintaining it at the same level, and continuing until the patient has improved clinically—that is, until the discharge ceases, pyrexia is not provoked, and complications, such as an arthritic effusion, disappear.

The requisite dosage may vary according to the individual resistance of the patient to the infection. Patients may be separated into three groups accordingly: (*a*) good, (*b*) medium, and (*c*) poor resistance. Probably (*a*) require a very small total dosage, recovery is remarkably rapid—two injections may be sufficient to enable the patient to effect a cure; (*b*) require the daily repetition of small doses over a longer period than (*a*); (*c*) require larger doses over a longer period still than (*a*) or (*b*).

The more acute the case the greater the necessity for the antitoxin. Delay in administering the serum renders the prognosis less satisfactory. Given early in arthritis the effect is rapid; administered later there is temporary improvement and then a tendency to relapse, necessitating further treatment.

Vaccines and sera hitherto produced are declared to be useful mostly in the chronic or only in the acute stages; seldom or never are they recommended for both types of case. These preliminary trials seem to indicate that this antitoxin affects both acute and chronic cases favourably. It may be that further refinements will be possible in the production, and perhaps the method of evaluating the product may be improved, but the fact remains that this experimental gonococcus antitoxin would appear to be the most valuable remedy which has yet been forthcoming since gonorrhoea was subject to scientific investigation.

Summary

1. In this preliminary report the results obtained with this experimental gonococcus antitoxin have been distinctly encouraging.

2. Acute and chronic cases, complicated and uncomplicated, respond equally well, which is in marked distinction to other biological preparations hitherto available.

3. Reactions and results indicate that this antitoxin possesses specific therapeutic properties; properly regulated controls confirm this.

4. Clinical evidence suggests that active as well as passive immunity is established.

5. Sufficient data are available to indicate that a remedy for the treatment of gonorrhoea has been evolved which offers considerable promise.

I wish to extend my thanks to Professor E. Mellanby for initiating this research; to Dr. Mervyn Gordon for his expert advice, particularly from the serological aspect; to Sir Frederick Menzies for his encouragement and kindness in allocating hospital accommodation, and to members of his staff for their co-operation; to Professor de Wesselow for valuable assistance in the later stages of the investigation, and for help from members of the staff at St. Thomas's Hospital; to Dr. N. S. Ferry and Dr. Stanley White of the Parke Davis Laboratories, to whom acknowledgement is made in the paper; and finally to Parke, Davis and Co. for their courtesy and ready acquiescence in placing their resources at my disposal.

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OUTBREAK OF FOOD POISONING IN AN INSTITUTION

BY

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In spite of the number of outbreaks of food poisoning well recorded I feel that it would be of use to the profession if these outbreaks were more often described. Much attention has been given to the problems of food poisoning in several countries, in this country particularly, by W. G. Savage and P. Bruce White, and their *Food Poisoning, A Study of 100 Recent Outbreaks* (Special Report Series No. 92, Medical Research Council) should be in the possession of every medical officer of health. The outbreak to be described occurred at a mental hospital with 763 inmates.

Onset of the Outbreak

On September 23, 1936, I was informed by the medical superintendent that several patients were ill, one desperately so, with vomiting or diarrhoea or both, and that food poisoning was suspected. Fifteen patients were found to be ill, and the clinical picture was severe headache, vomiting, diarrhoea, muscular pains, and temperatures varying from 100° to 103° F. The vomit was greenish and the diarrhoea a pale brown loose stool. Muscular pains were complained of chiefly in the legs. The onset of similar symptoms in so many people distributed on the male and female sides of the institution, which are fairly isolated from each other, with more of the staff affected, strongly suggested that infected food was the causal factor.

The dietary was inspected and the foods suspected were breakfast sausage, canned mutton, and possibly milk. The milk was supplied from the institution's farm and had been taken in all the wards and the hospital block. Some wards and the hospital block had no persons ill with the same symptoms as described above, so milk was not further considered. The breakfast sausage had been introduced for breakfast (about 9 a.m.) on September 20, and the canned mutton was used for dinner, at 12.30 p.m. on September 21. The breakfast sausage had been satisfactory, but four of the patients now ill had not partaken of the sausage, and these four patients were in different wards. It was noted that everyone who was ill had taken the canned mutton. There was no sausage left for bacteriological examination.

The mutton was canned in the Argentine, and was supplied in 6 lb. tins. Twenty-seven tins were opened in a larder by the storekeeper at 11 a.m. on September 21 and were taken directly into the kitchen, where they were divided into slabs for further slicing in the wards. The storekeeper noted one blown tin, which he opened after the mutton from the apparently good tins had been delivered to the kitchens. The mutton in this tin was in a state of decomposition, and was destroyed in a furnace. The empty tin was sent for bacteriological examination. The rest of the mutton appeared wholesome, and was eaten without any complaint. It was served untreated.

The Investigation

A few patients assist the kitchen staff, and on inquiry it was established that among the staff or patients in the kitchen none had had any recent suspicious illness. The kitchens were clean, but it was noted that there was a water-closet in a room opening directly into the kitchen. The temperature of the kitchen was not taken, but the rooms were definitely warm.

Every inmate who became unwell was regarded as suffering from food poisoning, and the number amounted to thirty-one. The shortest incubation period was fifteen hours and the longest seventy-two hours: average period for males, twenty-five hours; for females, thirty-four hours. During convalescence bradycardia was a feature. Two male patients died, one after being ill forty-two hours and the other after between forty-eight and seventy-two hours' illness. An attempt was made by the Welsh Board of Health to discover if any other persons in the country were infected from the same consignment, but without success.

NECROPSIES

Case 1.—A man of 35 years, well developed; the small intestine had a distinct pink colour, but no other macroscopic pathological condition was found.

Case 2.—A man of 59 years. The small intestine showed an abnormal pink colour; the spleen was exceedingly soft and friable. Nothing else abnormal was found.

From both cases portions of small intestine, liver, kidney, and spleen were sent for bacteriological examination to the Ministry of Health Bacteriological Laboratory. The report on the material sent to this laboratory was as follows:

BACTERIOLOGICAL EVIDENCE

Material	*Bacteriological Findings*
1. Six stools.	*B. enteritidis* Gaertner in large numbers.
2. One unopened tin of mutton from same consignment.	Negative result.
3. Two tins which had contained mutton.	Negative result.
4. Portion of liver, spleen, kidney, and small intestine from Case 1.	*B. enteritidis* +
5. Portion of liver, spleen, kidney, and small intestine from Case 2.	*B. enteritidis* + except in small intestine.

After recovery agglutination tests were carried out at the institution on the remaining twenty-nine suspected patients:

Patients	*Positive Agglutination for B. enteritidis*
Females (17)	12
Males (12)	9

Agglutination results varied from 1 in 25 to 1 in 500 +. Thus we can say that twenty-three patients almost certainly suffered from a *B. enteritidis* infection. Those who gave no positive agglutination were classified during the acute stages of their illness as "mild cases," and may have been cases which, through extreme caution, were included as probably suffering from food poisoning.

Agglutination tests against *B. enteritidis* were made on all the people who had handled the food, as follows:

Stores—two staff and three patients.
Kitchen—seven staff and twelve patients.
Bakehouse—one staff and three patients.
Farm (milkers)—three staff and eight patients.

The results of these tests showed:

Stores—no positive reactions.
Kitchen—eight positive reactions (six staff and two patients).
Bakehouse—one patient gave a positive result.
Farm—two patients gave positive results.

All these agglutination tests were carried out after ten days had elapsed from the beginning of the outbreak. It is interesting to note that only one member of the kitchen staff gave a negative result, and that particular maid was away the day that the mutton was used. Most admitted eating small portions of the mutton. None apparently were ill. One faecal bacteriological examination was made from each of the above persons, and all gave negative results.

Discussion

The outbreak caused two deaths, and at least twenty-one persons were infected by *B. enteritidis*, yet scientifically the food conveying the infection was not traced. However, there is little doubt that the canned mutton was responsible. The reasons for this belief are:

1. Every inmate taken ill had eaten the mutton.

2. All inmates who had not eaten the mutton were unaffected.

3. Every other article in the dietary was used in the hospital block, and no cases occurred there.

4. All kitchen maids showed a positive agglutination reaction to *B. enteritidis* except one, and she was absent on the day that the mutton was in the kitchen.

It is actually impossible to say what the source of the infection was, but an attempt can be made to deduce it. Savage and Bruce White state that there are three possible primary reservoirs:

1. A habitat outside the animal (including human) body.

2. Infection from a human case—infected sufferer or passive carrier.

3. Infection from an animal source—

(*a*) Specifically infected animal used for food.

(*b*) Sound food infected by a person suffering from a Salmonella infection or acting as a carrier of such bacilli.

1. Savage and White maintain that while this source is possible suspected material has always yielded negative results, and in this outbreak I find it difficult to admit the possibility.

2. This source can be discounted fairly certainly, as no illness at all suggestive could be discovered.

3. There was no evidence to show that the mutton could have been infected from an animal source in the institution. The food was traced from the tin to the wards, and it seems certain that it could not have been infected. Thus we are left to consider:

(*a*) Was an infected animal used for the food—that is, ante-mortem infection?

(*b*) Was the animal originally healthy and the meat infected post mortem?

If (*a*), then the bacteria survived the "cooking" process, which is unlikely. Moreover, a primary *B. enteritidis* infection of sheep is vary rare. Does (*b*) appear to be a more likely source of the infection? From the number ill and proved to have been suffering from a *B. enteritidis* infection and the number who partook of the canned mutton—that is, twenty-three out of over 700—it is reasonable to suggest that one tin only was infected. Two wards (M 2 and F 2) supplied thirteen out of the twenty-three cases. The cases at the time of the outbreak were classified as mild, moderate, and fatal. There were nine mild cases, twelve moderate, and two fatal cases. Ward M 2 had eight moderate and two fatal cases, and ward F 2 showed four moderate cases. Thus it seems that the portion of the can most heavily infected went to ward M 2 and the next most heavily infected to ward F 2. The average incubation period in ward M 2 was twenty hours and in ward F 2 thirty-one hours. It is therefore reasonable to say that there was no uniform infection of the meat in the can, as might be expected from an ante-mortem infection, but a grading from one portion to another, as might be expected if one portion was originally infected before sealing of the tin and spread gradually by continuity of the material. This suggests, therefore, the probability of a post-mortem infection rather than an ante-mortem infection.

Summary

1. An outbreak of gastro-enteritis in which two persons died and twenty-one persons were victims was found to be due to *B. enteritidis*.

2. It is suggested that canned mutton was the food involved.

3. By probability only, and by no scientific proof, it is suggested that the mutton was infected in some manner, and was not taken from an infected animal.

I wish to thank Dr. Sidney Davies, medical superintendent, for permission to record this outbreak and for his untiring help, and also Dr. Scott of the Ministry of Health for his bacteriological reports. I am greatly indebted to Dr. W. G. Savage, county medical officer of health, Somerset, for his constructive criticism.

TREATMENT OF DEPRESSED FRACTURES OF THE MALAR BONE

BY

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A fracture which is becoming common is that in which the malar bone is pushed into the antrum. Sir Harold Gillies informed me that it is becoming particularly common in England, as the almost universal use of safety glass in cars is causing this fracture to replace the former facial cuts in automobile accidents, but even in Australia, where safety glass is only now coming into common use, it is often seen.

In this fracture the orbital, antral, and zygomatic attachments of the malar bone are fractured and the body of the malar bone is pushed partly or wholly into the antrum. The malar bone being strong is rarely comminuted, but not so the lateral wall of the orbit and the infra-orbital margin of the maxilla. If the case be seen soon after the accident the diagnosis is easily made, but even if seen after several hours the depression of the malar bone is rarely masked by the superficial swelling. When there is much swelling an alteration in the shape of the lower edge of the orbit is generally such as to make the presence of this fracture highly probable. The diagnosis in difficult cases is made by *x*-rays, and especially by one taken vertically of the side of the head from below upwards (Stone's position—Gillies, Kilner, and Stone, 1927), when the prominence of the zygomatic process on the affected side will be absent.

Often the fracture causes loss of sensation over the area of distribution of the infra-orbital nerve. As a rule the antral cavity is filled with blood clot.

Difficulties in Treatment

Treatment by the usual methods is unsatisfactory, the multitude of methods advocated indicating this. The advice generally given is to make an incision under the lip similar to that made in a Caldwell-Luc antrostomy and to open the antrum and elevate the malar bone. The reduction of the fragment is easy by this method, but no facilities are provided for retaining the bone in the correct position, and no allowance is made for drainage of the antrum. Such drainage should be instituted after an antrum full of blood clot has been opened into the buccal cavity, which carries such an infective flora.

To reduce the displacement Silverman uses tenaculum forceps, which seize the malar bone through the substance of the cheek, but the amount of superficial swelling or the degree of displacement into the antrum would often preclude this method, whilst at any time such treatment of the cheek savours of the barbarous.

Another method described by Mead (1933) is to screw a corkscrew into the malar bone through the cheek. A better method than this would be to drill a hole into the malar bone through a small incision in the cheek and to tap a thread, into which a tool could be screwed which would allow reduction either alone or combined with some form of extension apparatus.

The various other methods do not merit mention except the most ingenious method of Gillies and Kilner (1927), in which an elevator is passed through a small incision above the hair line in the temporal region. This is manœuvred down on the surface of the temporal muscle under the root of the zygomatic process, which is then levered outwards. This method is often an excellent one, but it does not always succeed in retaining the bone in the corrected position. Neither does it provide for drainage of the blood clot in the antrum. If the antrum is not opened into the mouth at the operation such drainage is not absolutely necessary, for if left alone such a collection of blood clot rarely suppurates; but one of the most noticeable things about the method to be described is that those cases with moderate or severe pain nearly always get immediate relief as soon as the pressure caused by the clot is relieved by the establishment of drainage.

The Author's Method

Dissatisfaction with the accepted methods of dealing with this fracture has led me to experiment with methods of reducing the displacement by working through an intranasal antrostomy opening. Such a method has for some time now been standardized and is giving great satisfaction.

The operation is performed by making a vertical incision in the nasal fossa from immediately above and in front of the anterior extremity of the inferior turbinate

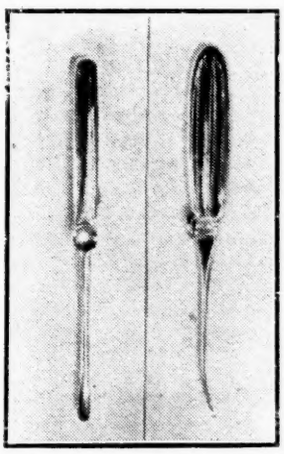

FIG. 1.—Instrument for transantral elevation of depressed malar bone.

bone to well on to the floor of the nose. The incision is carried as deep as the antro-medial border of the maxilla, which is then bitten away with strong Jansen-Middleton forceps as in the Denker operation and the bony opening is carried backwards into the inferior meatus. The clot in the antrum is displaced by packing the antrum with vaseline gauze, and when it has been displaced the gauze is withdrawn. An elevator which has been made for me by Elliott Brothers of Sydney (see Fig. 1) is then inserted and the body of the malar bone is elevated into position (see Fig. 2). In the event of such an elevator not being available, the handle of a teaspoon with a narrow upper end can be used unless impaction is unusually firm. The end of the spoon handle is inserted into the antrum so that its surface is horizontal

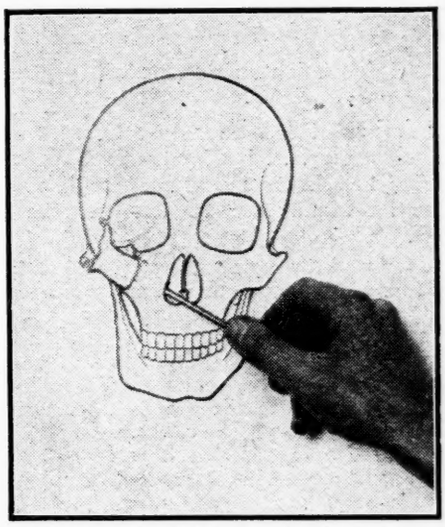

FIG. 2.—Showing how, if the opening is made at the junction of the nasal and anterior walls of the antrum, the depressed malar bone can be elevated with a comparatively straight instrument.

with the patient in the anatomical position. It is then turned so that the surface is vertical. Previously I used a more posterior antrostomy opening, but this necessitated a much more curved elevator. In this older method the tip of the hook-like elevator was used to perform the reduction, but with the later modification the use of a straighter elevator is possible, and the reduction is performed with the side of it instead of the top, as formerly.

After-treatment

Usually the displacement has no tendency to recur, and this is what one would expect as no important muscles are attached to the bony fragment, but where the edges of the opening into the maxilla are badly comminuted the malar bone is pressed back into the antrum by the weight of the cheek. This is easily controlled by packing the antrum through the opening made with a long piece of 3/4-inch-wide vaseline gauze. This is removed after two days and would be replaced if required, but so far this has not been called for. Antral lavage is carried out a few times during convalescence.

Advantages of the Method

This method provides an easy and certain means of reduction and retention of the fragment in position. It also usually makes the patients quite comfortable as soon as the drainage is provided. Even in the few cases where packing has to be left the patient is usually not more uncomfortable than before operation.

The main objection to the method in the eyes of the general surgeon is that assistance must be sought from those used to intranasal manipulations, but as the method is so much more satisfactory than any other described, this should not exclude it.

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Silverman. Quoted by Mead.

Clinical Memoranda

Two Unusual Deaths

The two cases reported below appear to have unusual features which may be of some medico-legal interest. I am indebted to the coroner for Derby, Captain T. H. Bishop, for permission to publish them.

A FAILED SUICIDE

"I respectfully beg to report that at 3 p.m. December 18, 1936, I received information that X, aged 48 years, textile manufacturer . . . had committed suicide by poisoning. He had become depressed of late owing to pains in the head and business worries." So ran the police report.

X had left for work by car at 8.30 a.m., and at 11.45 a.m. his wife had found him lying in the porchway in an exhausted condition. A note in his handwriting found in the garage said: "Children, be good to your mother, as she has been an angel to me. Goodbye. God bless you all. To know all is to forgive all; no mourning for me, a failure." A jar of creosote was found near the note and it was assumed he had taken some.

At the post-mortem examination it was noted that there was cyanosis of the head, neck, and extremities, but no oedema. The mouth, oesophagus, stomach, and intestines were all normal; there was nothing in any way suggestive of poisoning by creosote. The stomach, with its content of about half an ounce of pink and somewhat frothy mucus was placed in a jar and sent for analysis for poisons. The analyst (Miss M. Staynes) later reported that an examination for all types of poison had been negative. The heart weighed 15 oz. The tricuspid orifice admitted four fingers with ease, but the mitral oriface was so stenosed that it would not admit one finger readily. He had a typical old rheumatic mitral stenosis. The aortic and pulmonary valves were normal. The coronaries showed advanced arteriosclerosis with calcification. The blood generally was dark and fluid. There was some pulmonary oedema. The liver was but little enlarged. Death had been due to cardiac failure secondary to mitral stenosis and arteriosclerosis.

Apparently it is not even given to suicides to determine the manner of their death in all cases. It is well known that slightly more than one-tenth of people who attempt to commit suicide by drowning die of heart failure before it is possible for them to drown. But such people are not commonly given a certificate of death from natural causes because the suicidal act had commenced. Similarly the usual cause of death after criminal abortion is sepsis, but death from syncope during the act of procuring the abortion has been recorded. Such a death is not due to natural causes but to murder. The present case is of great interest because there can be little doubt that the untimely intervention of heart failure prevented suicide. The circumstances point strongly to the suicidal intent. Evidently the excitement associated with this was enough to bring about the failure of the hypertrophied heart, which was labouring under the double disability of mitral stenosis and coronary sclerosis. The coroner gave a certificate of death from natural causes, which was obviously correct, but had X been heading for the river instead of the poison then—at least the fears of some ecclesiastics about burials in hallowed ground do seem like hair-splitting.

A PECULIAR DROWNING

A few days after the case reported above I made a necropsy on the body of a girl of 4 months.

About half an hour before death she had had a drink of milk and was playing on a sofa while her parents had their dinner. Suddenly she threw up her arms and went black. The parents picked her up and rushed her out. They evidently had no idea of suitable treatment, and the girl died immediately. By the time their doctor arrived she was beyond all aid. The baby was a splendid physical specimen and had had no sicknesses during her life.

On opening the thorax the lungs did not collapse at all. Milk curds exactly similar to those in the stomach were found the whole way down the trachea and larger bronchi, which also contained a very small amount of blood-stained froth. Both lungs were "waterlogged" and retained the impression of a finger. The stomach contained a large quantity of curdled milk and mucus. The blood generally was dark and fluid. Previous to this incident all the organs had been perfectly normal.

The parents' story was thus confirmed by the post-mortem examination. After a hearty meal the baby had inhaled its vomitus and drowned. This is fortunately a rare, but by no means unknown, mode of death.

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Treatment of Repeated Abortion

Since evidence of the possibility of treating sterility referable to endocrine inadequacy is at present of general interest, it seems worth while to report a repetition of success in securing pregnancy in the patient who was the subject of a note published in this *Journal* on June 22, 1935.

The child born in November, 1934, was weaned at 4½ months, and has thriven. The mother suffered somewhat during 1935 from asthenia and remained underweight. The menses needed regulation by prolan and calcium gluconate from October onwards. Improvement resulted, and contraceptive precautions were dropped. Pregnancy followed in January, 1936. Professor Crew kindly carried out an Aschheim-Zondek test on March 26, and reported the result "a definite positive." A 1 in 10 dilution gave one mouse negative, one positive; 1 in 100 was negative. These findings corresponded with the results of clinical examination, and suggested a normal pregnancy of two months' duration. This was a much more favourable report than that on the Aschheim-Zondek on the previous pregnancy, possibly ascribable to the use of prolan for three months preceding conception.

It was decided to take no risks, so antuitrin S (1 c.cm.) every other day was given for three months, then reduced to twice weekly for two months, then omitted for the eighth and ninth. Wheat-germ oil was taken throughout, also calcium gluconate and glucose D with insulin. The patient's general condition was above her average, partly due no doubt to confidence in the outcome of the pregnancy. On October 6 a breech presentation was corrected by abdominal manipulation. Labour began at 4 a.m. on October 13, and delivery was effected spontaneously at 9.15 a.m. The baby weighed 7½ lb., and was well formed and healthy. The placenta was normal, quite unlike that of the miscarriage four years earlier, in which the villi were cystic and the decidual cells degenerate. Successful lactation followed.

It seems possible that less active treatment might have sufficed, but we lack knowledge of exactly where to stop with safety, quantitative estimations of the prolan content in pregnancy urine being still an uncertain guide. In another case, a patient who had previously had several miscarriages maintained a pregnancy up to the seventh month, when injections of antuitrin S were stopped. Miscarriage followed within a fortnight.

I have also thought hormone substitution treatment of minor symptoms such as headache, muscular asthenia, etc., of value in pregnancy, using the smallest possible doses.

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Reviews

TEXTBOOKS OF MEDICINE

The Practice of Medicine. By Jonathan Campbell Meakins, M.D., LL.D. (Pp. 1,343; 505 figures (35 in colour). 42s. net.) London: H. Kimpton. 1936.
Textbook of Medicine. By Various Authors. Edited by J. J. Conybeare, *M.C.*, M.D., F.R.C.P. Third edition. (Pp. 1,027; illustrated. 21s.) Edinburgh: E. and S. Livingstone. 1936.

It is a noteworthy event when a full-blown textbook of medicine is produced from one of the Dominions. The late Sir William Osler was Canadian-born, and his influence on the development of transatlantic medicine, as indeed on British medicine in general, has been enormous. His textbook of medicine, however, was written during his tenure of the professorship of Baltimore. In the new *Practice of Medicine,* by Professor Jonathan Campbell Meakins, we have therefore the first full textbook of medicine from Britain over-seas. In its breadth of view and completeness it reminds us of that other splendid production from McGill University, the late Professor Adami's *Pathology*.

In his disarming preface Professor Meakins explains that his object has not been so much to write for the specialist or produce an encyclopaedia as to interest and instruct the student and general practitioner. Recognizing that in practice, whether in hospital or in private work, so far as the patient is concerned, disease consists of symptoms, he has given particular prominence to symptoms in his book. On this basis their causation has been described where this is possible and their significance pointed out. On analysing a series of a thousand cases it was found that the commonest symptoms tended to recur very often and were referable to no one particular system so that they could not be used for classification; these were pain, weakness, loss of weight, fatigue, shortness of breath, and fever. There remain a number of symptoms which point to an affection of one or other system, and these when followed up may give valuable clues to diagnosis and indications for treatment. This has led the author to a new and individual method of presentation. Following up symptoms he has grouped the diseases under the systems primarily affected. It is unusual in a textbook to have cerebro-spinal meningitis discussed in the section on the central nervous system, typhoid fever and cholera among intestinal diseases, rheumatic fever in affections of the nasopharynx, but one can see that this is a logical outcome of the method adopted.

The description of the various system diseases is concise and practical. The student, led to a particular system by the patient's leading symptom, will find set out the various diseases which have to be thought of, their differential diagnosis is explained, and the corresponding treatment is advised. The sections are up to date, and Professor Meakins has had the advantage of experts in certain subjects among his colleagues as collaborators. There remain, then, after the systematic sections certain infectious diseases conveyed by parenteral inoculation, diseases due to allergy, diseases due to abnormal environments, variations of heat and cold, of barometric pressure, sea-sickness, exposure to radium, *x* rays, or electric shock, and a group of diseases caused by chemicals and drugs. These chapters are as useful and informative as those dealing with system diseases. The author points out the modern dangers of excess in the prescription of barbiturate drugs, enumerates those from which death has been reported, and gives helpful points in diagnosis and treatment.

Professor Meakins observes that this is a pictorial age and that many factual data are well set out by graphic methods. Many students can learn and remember from a simple, even crude, diagram facts that no amount of reading or hearing can impress. The author has therefore introduced many illustrations—of patients, of pathological specimens, graphs, and radiographs—with the hope that they may be more informative than a word description, and the result on the whole has been highly successful. The reproductions of *x*-ray photographs leave much to be desired in definition, however, and this detracts from their value.

The textbook is remarkably complete. It is pleasant to handle, and we have no hesitation in recommending it as a reliable and up-to-date guide to medical practice.

Conybeare's Textbook of Medicine compresses into a thousand pages the essentials of the subject, and the new edition maintains the high standard set by the two former ones. Dr. Conybeare has been assisted by a team of experts, each responsible for revising and in some instances rewriting parts of the book. The section on endocrines has been extended and new work on the pituitary gland and its control of other endocrine glands is incorporated. The authors still differentiate toxic adenoma from other forms of exophthalmic goitre. A more fitting description is that they are agglomerations of active glandular tissue rather than true adenomata, and the statement that these forms are sometimes described as secondary and primary Graves's disease is not sufficiently expanded. The section on renal disease has been rewritten by Dr. Osman and now gives a very fair account of modern views on kidney function and dysfunction. Under the heading of Bright's disease the classification adopted is in three main groups —nephritis, nephrosis, and nephrosclerosis—each of these groups being subdivided. The section closes with discussions of affections of the urinary tract, new growths of the kidney, and renal calculus. Dr. Conybeare has brought up to date the section on the alimentary canal, many of the articles being rewritten, and has revised the one dealing with affections of the bones and joints, adopting the classification suggested by the British Committee on Chronic Rheumatic Diseases. The book should continue to be useful to students and practitioners.

THE COLLOIDAL STATE

Kolloidik. Eine Einführung in die Probleme der Modernen Kolloidwissenschaft. By Priv. Doz. Dr. A. von Buzagh. (Pp. 323; 68 figures. RM. 15; geb. RM. 16.50.) Dresden and Leipzig: T. Steinkopff. 1936.

This Introduction to Modern Colloidal Science, by Dr. von Buzagh of Budapest, is a textbook of some 300 pages, in which the author sets forth in a systematic manner our present knowledge of the chemistry and physics of the colloidal state. The chemistry of colloids is a field in which the biochemists have taken a particularly keen interest, because living matter is composed of colloidal material; hence the first developments of this comparatively young science were largely associated with biochemistry. This stage of rather one-sided development has now passed, and the work under review deals with the properties of matter in the colloidal state from the point of view of general physical chemistry. As the author remarks, "Colloidal chemistry has left its childhood behind, and has reached the stage of objective criticism."

In general the textbook gives a very clear account of the physico-chemical laws governing the behaviour of matter in the colloidal state. One inevitable result of

the development of colloidal chemistry referred to above has been to divert attention from the more complex systems to the simpler ones, whose behaviour can be more easily analysed. Hence Dr. von Buzagh describes the properties of dusts, smokes, and inorganic emulsions in preference to the properties of protoplasm, and the information of immediate interest to the biological sciences in this textbook is less than was contained in similar works a decade ago. A phase of this character is obviously essential to the development of colloidal chemistry and will ultimately prove of great service to biology, because the chief hope for the elucidation of the properties of living matter lies in the increase of fundamental knowledge about the properties of matter dispersed in colloidal dimensions.

RADIOLOGY OF THE DIGESTIVE TRACT

The Digestive Tract. A Radiological Study of its Anatomy, Physiology, and Pathology. By Alfred E. Barclay, O.B.E., M.A., M.D., D.M.R. and E., M.R.C.P. Second edition. (Pp. 427; 296 figures. 36s. net.) London: Cambridge University Press. 1936.

In 1933 we welcomed Dr. Barclay's book on his radiological studies of the anatomy, physiology, and pathology of the digestive tract for the individualistic and broad-minded way in which it was compiled. In the second revised edition he has amplified and rewritten much of the work, which is distinguished throughout by being a record of his personal experiences. His own observations and what he has learned from others are blended in a philosophic way into a readable and instructive book. All the background of the radiologist's work, the installation and management of his apparatus, the protection of himself, his patient, and his assistants from possible risks, the technique of screening and radiography are capably dealt with. Dr. Barclay has correlated the accepted views on the anatomy of the digestive organs with results obtained by *x*-ray examination after giving barium or dyes to distend and define the hollow viscera. In this way he has made independent researches on the physiology of the act of swallowing. He now insists even more emphatically than before on the absence of any symptoms that could be found to arise from mere change of position of the stomach and colon. Filling and tone are physiological variations; but position, with its so-called kinks of intestine, the author regards as within physiological limits and as offering no cause for apparent delay or indication for surgical intervention.

Dr. Barclay's individualistic method leads him to difficulty in accepting the rather widely established views on the importance of laying stress on the pictures of rugae or striae caused by mucous membrane folds in the filling or emptying stomach. Much of the recent work, it must be recognized, is established on the correlation of the *x*-ray picture with views of the stomach lining obtained directly by means of the gastroscope, and confirmed by macroscopic and microscopical specimens removed at operation and fixed at once. Dr. Barclay insists on the value of interpreting variations in the course of peristaltic waves on the contour of the stomach, and gives insufficient weight to the appearances of the lining of the stomach. Nor does he bring into his illustrations instances of these appearances with modern technique, although the diagnosis of two ulcers of the four on page 234 is based on this principle. It may be that too much emphasis is at present being laid on evidences of gastritis, but we feel that as things are now a more judicious attitude may be advisable rather than dismissing the subject in a couple of pages. The chapter on gastric ulcer gives a good description of the subject, but many of the radiographs submitted as illustrations are less good than can be got by modern technique. This criticism applies to the chapter on the colon and elsewhere, but duodenal ulcer is beautifully illustrated. The diaphragm is briefly described, but diaphragmatic hernia, and especially the relation of congenital short oesophagus and hernia of the cardiac end of the stomach, are not clearly put before the reader.

Dr. Barclay's book is so good that we hope, when there is the call for another edition, that the whole may be brought up to the standard of the best, which is indeed a high one.

CORRECTION OF SQUINT

Squint Training. By M. A. Pugh, M.R.C.S. (Pp. 117; 42 figures. 7s. 6d. net.) London: Humphrey Milford, Oxford University Press. 1936.

The progressive employment of the methods of training of squinters which were so systematically and usefully developed by the late Claud Worth has brought into being quite a library of books on the subject. Of these the latest is by the medical officer to the orthoptic department of Moorfields Eye Hospital. The opportunities for observation and assessment of results presented by such a department can be second to none.

Dr. Muriel Pugh gives the results of the primary causes which enable some grouping to be made of squinters. Of one thousand cases 10 per cent. were due to physical defects either in the muscles or in the eyes. These are obviously the most difficult cases to deal with. If there is serious eye defect then no treatment can be effective; if there is muscle defect no training can avail until the surgeon has adjusted the muscle so far as this can be done. The second group, including some 50 per cent., is that in which there is more or less error of refraction, and in which the provision of glasses exerts a favourable influence upon the angle of the squint. In these cases the object of training is to re-establish a normal convergence-accommodation link when the ametropia has been corrected by suitable glasses. Cases of this group react very well to exercises; they are those which are the least difficult to treat. Both glasses and exercise are necessary for success.

The third group, of about 20 per cent. of the total, are those whose squint is due to fusion defect. Whereas those of the second group may have initial symptoms of diplopia such symptoms are not found in these children. They are particularly liable to develop "false projection." This bad habit has to be suppressed, as well as the normal habit developed, so that the length of time and amount of work necessary for a successful result is much greater in this group than in the former, but normal binocular vision can be restored in a large proportion of cases if enough patience be expended. The fourth group, of another 20 per cent., are the "psychological squints," a type that has been emphasized by Inman. Of all the queer reactions of human nature, and of innocent infantile human nature, one of the queerest is the production of a squint because a new baby has arrived in the family. The elder child mopes, then squints, especially when it looks at the baby. No wonder our forefathers thought a squint was the evil eye! Left-handedness and stammering is common in this group. The treatment is more psychological than orthoptic.

In succeeding chapters the author develops the whole technique of training and its adaptation to the different classes of cases. She is able to set out the facts with clearness and with a minimum of that kind of technical verbiage which is more clogging than liberating. She has done her work well, and it will be of lasting value to many colleagues.

SURGICAL PROGRESS

The 1936 Year Book of General Surgery. Edited by Evarts A. Graham, A.B., M.D. (Pp. 831; illustrated. 3 dollars or 12s. 6d., postage 6d.) Chicago: The Year Book Publishers. London: H. K. Lewis and Co. 1936.

This book, edited by Professor Evarts Graham of St. Louis, is a guide to some of the chief developments in surgery during the year. It is one of a series of ten which the American publishers tell us form the Practical Medicine Year Books and are now in their thirty-sixth year. The whole ten volumes comprise a survey of progress in the various branches of medicine and may be compared with the *Medical Annual,* which is so much appreciated and extensively used in this country.

The title, "General Surgery," is a wide one, as sections are included on the brain and meninges, the spine and cord, and on orthopaedics and chest surgery, but abdominal surgery is well represented. Of the eight hundred odd pages of text nearly two hundred are taken up by references to the liver, gall-bladder, and bile ducts. Should this seem a little disproportionate we must remember that it was the distinguished editor of the Year Book who introduced cholecystography into surgery—and who is to question him if he regards as of chief importance the particular branch of surgery in which he is particularly interested? The editorial comments, which are in small bracketed print of close type interspersed through the various sections, are an attractive feature, as is also the cross-referencing to previous editions of the year book. The review for 1936 has brought out a number of valuable comprehensive studies such as the question of the treatment of bleeding peptic ulcers, the after-effects of gastro-duodenal ulcer, and the treatment of fractures, and important contributions to these questions are reviewed in the text. The volume is well illustrated, of convenient size, and of very readable print. There is no reference to surgery of the sympathetic nervous system: perhaps this indicates a swing of the pendulum!

This continues to be an attractive yearly publication, which should be a useful addition to the bookshelves of both the surgeon and the general practitioner, since it enables either to refer to recent developments in surgery with a minimum of effort.

Notes on Books

Dr. BERNARD SACHS'S *Keeping Your Child Normal* (New York: Paul B. Hoeber, 1.50 dollars) was first published ten years ago under the title of *The Normal Child.* The author stresses the fact that, while much care and thought have been lavished on defectives, the problem of the normal child has been somewhat neglected. He cites the justifiable lament: "But I am a perfectly normal child, so I don't get any attention." The present volume, which has been revised and brought up to date, is intended as a guide for parents, teachers, and physicians with a view to remedying this deficiency. Dr. Sachs combines a scientific outlook, fortified by wide experience of child neurology, with wisdom and common sense, and the book contains much helpful advice for the surprisingly large number of people who need assistance in the problem of bringing up children with efficiency and sympathy.

The fourth volume of the forty-sixth series of *International Clinics* (J. B. Lippincott Co., set of 4 volumes, 50s.) contains nineteen papers, of which seventeen are devoted to internal medicine and two to dermatology. Among the former special attention may be drawn to those on gastroscopy, by Dr. Jacob Schloss of Boston; changes in blood protein during acute rheumatic carditis, by Dr. Alwin F. Coburn of New York; essential thrombocytopenic purpura, by Dr. Herbert Z. Griffin of the Mayo Clinic; nutritional oedema, by Dr. John B. Youmans of the Vanderbilt University School of Medicine, Nashville; the medical aspect and treatment of chronic gall-bladder disease, by Dr. George Morris Piersol of Philadelphia; and the relation of accidents and injury to pulmonary tuberculosis, by Dr. John B. Hawes of Boston. The section on dermatology contains two papers by Dr. Isaac R. Pels of the Johns Hopkins School of Medicine on acne and scabies respectively.

The work on *Infektionskrankheiten,* by Professor WERNER SCHULTZ, which forms part of the series for post-graduate instruction edited by Professors L. R. Grote, A. Fromme, and K. Warnekros (Dresden and Leipzig, Steinkopff, R.M.12) gives a clear, concise, and up-to-date account of the common infectious diseases prevalent in temperate climates as well as of malaria and the treatment of tropical diseases, which are described by Dr. A. Haver. Professor Schultz, who is well known in this country as being the first to describe agranulocytosis in 1922, is peculiarly fitted for his task, having had many years' practical experience of infectious diseases as well as having been a lecturer on the subject at the Berlin Academy and University. While special attention is paid to treatment, the pathology and bacteriology are adequately dealt with. A bibliography of almost exclusively recent German literature is appended.

Preparations and Appliances

SALICYLYSIN PREPARATIONS

Salicylysin liniment and ointment (Allen and Hanburys Ltd.) contain 20 per cent. of glycol iodosalicylic ester. This is a new compound which contains iodine and salicylic acid, but does not stain the skin and is practically odourless. The preparations are recommended for local treatment of arthritis, fibrositis, sprains, etc.

TABLOID SULPHONAMIDE-P

Tabloid brand sulphonamide-P (0.5 gramme), issued by Burroughs Wellcome and Co., is intended for oral administration in the treatment of infections with haemolytic streptococci. Observations in animals and in man agree in showing that it is possible by administration of this drug to render the blood bactericidal to those organisms. This important discovery is so recent that the clinical evidence, although favourable, is at present limited. The makers issue with their product a leaflet containing instructions for use and certain important suggestions. In particular, they point out the need for determining whether the infection it is proposed to treat is due to haemolytic streptococci.

SULPHONAMIDE-P (B.D.H.)

Sulphonamide-P (B.D.H.) is a tablet preparation (British Drug Houses Ltd.) of the new disinfectant para-amino-benzene-sulphonamide. This drug has been proved to render the blood antiseptic to haemolytic streptococci. A remarkable feature of this action is that it can be produced by oral administration. This discovery has naturally aroused great interest and the preliminary clinical reports are favourable. The drug is being tried in the treatment of puerperal septicaemia, erysipelas, scarlet fever, tonsillitis, and other infections of haemolytic streptococci.

AMMONIUM MANDELATE SYRUP

Syrup of ammonium mandelate (C. J. Hewlett and Son, Ltd.) contains 3 grammes of mandelic acid in 2 fluid drachms. This preparation is a substitute for the more complex method of giving sodium mandelate and ammonium chloride separately to produce urinary disinfection. Usually the ammonium mandelate alone is sufficient to produce an adequate urinary acidity, but if this does not occur ammonium chloride may be given in addition. The preparation provides a convenient and palatable method for mandelic acid therapy.

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PHYSICAL EDUCATION: THE GOVERNMENT'S SCHEME

Through the publication of the reports of its committees on nutrition and physical education the British Medical Association has taken the lead in stimulating a widespread interest in the improvement of the national health and physique. Whether the full value of these reports has received official acknowledgement may perhaps be doubted. In the Government's White Paper on physical training and recreation, details of which are given elsewhere in this issue (p. 342), there is but a single reference to the Association's Committee on Physical Education; and the reference is one which might lead the reader to suppose that this committee did no more than "endorse" the policy outlined in Circular 1445, issued by the Board of Education in January of last year. In fact the Association's committee made many original recommendations, one of which, relating to the provision of suitable clothing and shoes for gymnastics in schools, has since been "endorsed" by the Board.

The White Paper issued this week (Cmd. 5364) deals primarily with the development and extension of the facilities available for persons no longer attending school. This subject, which had been mentioned briefly in Circular 1445, was discussed at length in the report of the B.M.A. Physical Education Committee[1]; and it may perhaps be assumed that the work of the committee has contributed usefully to the shaping of the Government's proposals. Certainly these proposals include much that the committee recommended and nothing that conflicts with its suggestions. Entirely in accord with the views of the Association's committee are the decisions of the Government on the three fundamental questions of policy discussed in the White Paper: the scheme is to be a voluntary one; it is to be built up by extension of the work of existing agencies; and it is to include not only formal exercises but also various physical activities of a recreative character. As to the wisdom of these decisions there will be general agreement.

The detailed proposals include provision for additional gymnasia and gymnastic equipment, with changing-rooms and shower baths; for an extension of the existing facilities for outdoor games, swimming, and other forms of physical recreation; and for the supply of an adequate number of suitably trained teachers and leaders. Attention is to be paid also to publicity and propaganda. The plan entails co-operation, central and local, between public bodies and voluntary organizations. In important ways it extends the powers of local authorities; in particular, it enables local education authorities to provide facilities for persons over 18 years of age who are not attending educational institutions. In making this last provision the Government has adopted a suggestion originally put forward by the Association's committee. But, indeed, practically all the above-mentioned features of the scheme are to be found among the committee's recommendations.

Circular 1445 of the Board of Education concluded with these words: "The Board desire to impress upon authorities the importance of developing their arrangements for physical education, and to express the hope that they will co-operate cordially with voluntary organizations in providing facilities for young people no longer at school. The foundations for a complete and efficient system of physical education have been laid; it is now the task of authorities, teachers, and voluntary organizations throughout the country to build upon those foundations a complete structure, which will be of inestimable value in the development of a healthy, happy, and vigorous community." How this task was to be accomplished without an improved organization and an increased supply of funds was not clear to the Association's committee, which therefore recommended that "schemes for the promotion of physical education in the community as a whole should be provided with a permanent administration and be guaranteed adequate financial support." The Government now acknowledges that "without some measure of central co-ordination of effort the provision must necessarily be sporadic and incomplete," and that "the funds available from all sources are insufficient to cover the ground as fully as is needed." The measures which have been devised to meet this double need are described on another page. The adequacy of the proposed financial provision remains to be seen; the administrative machinery is well conceived, and should prove eminently workable.

Of particular interest to the medical profession is the statement that the proposed National College of Physical Training will include among its activities the investigation of problems connected with the physiology of physical training. The British Medical Association's committee strongly recom-

[1] *British Medical Journal Supplement*, April 18, 1936; reprinted as a pamphlet, price 6d.

mended that such research should be undertaken. It stressed also the desirability of a far closer relation than has existed in the past between physical education and the science and art of medicine; and, as a means to this end, it suggested the establishment of post-graduate courses designed to equip medical men and women for the medical supervision of physical activities. Perhaps in time such courses may be instituted at the National College. However this may be, the present proposals of the Government should go far to bring about the desired improvement of the national physique, and they must be regarded as deserving high praise.

CANCER PROBLEMS

On February 3 Dr. W. Cramer of the Imperial Cancer Research Fund read to the Assurance Medical Society, under the title "Cancer and the Expectation of Life," a very lucid and instructive paper. The title does the paper some injustice; it was presumably suggested by the belief that officers of insurance companies have a special partiality for the arithmetical average called the expectation of life—that is, the average number of years lived by persons who reach any year of age in and from that year of age. This average has increased at all ages of males below 62 and at all ages of females below 74 between the dates of the last two national life tables. Dr. Cramer really discusses much more interesting topics. Is there reason to believe that a heritable predisposition to develop cancer occurs? Is there reason to believe that environmental factors, other than a small number of notorious stimuli, favour or oppose the development of cancer?

With regard to the first question, the existence of an inherited disposition in mice is proven. Dr. Cramer thinks that the statistical data of Deelman (1930), Waaler (1931), and Wassink (1935) are sufficient to demonstrate the existence of a heritable factor in man. One of the reasons why this was not shown earlier is the apparent specificity of the factor. It seems, for instance, that when the blood relatives of cancer patients are traced the female relatives of women with cancer of the breast or cancer of the uterus have a higher incidence of cancer of the breast or uterus than other women. They do not suffer from cancer of other sites, nor do their male relations, at rates higher than those of the general population. So far as proportional incidence is concerned the evidence is strong. To assess the absolute worsening in the prognosis for a person some of whose ascendants had cancer in comparison with that for a person without this history is an impossible task. Dr. Cramer calls attention to the exceptional position of cancer of the breast in this country, the rate for which is high and shows an increasing incidence even in the earlier age groups. "One cannot avoid, therefore," he writes, "the uncomfortable suspicion that this may be due to an increase in the number of individuals with an inherited susceptibility to breast cancer. Fortunately we can set against this a decrease in the mortality from uterine cancer." We do not find this wholly convincing. It appears that in respect of both organs there is a heritable predisposition. Assuming that the general lowering of mortality at early ages has led to the survival to cancer age of a larger proportion of the "unfit," there should have been an increase in the numbers of susceptibles of both types. The difference between the rates for the two organs seems to be associated with changes in the birth rate. It is known that the rate of mortality from cancer of the breast is, other things equal, higher in virgins and that for cancer of the cervix uteri lower than among women who have borne children. Unfortunately, large-scale data must depend upon the broad classification by civil state. We cannot study the evolution in time of the mortality rates for women who have been pregnant 0, 1, 2, etc., times on unbiased collections of data.

The second part of Dr. Cramer's paper is based upon the late Dr. T. H. C. Stevenson's analysis of the national data, which tended to show that the incidence of fatal cancer of "exposed" sites increased as one passed down the economic scale. Dr. Cramer very properly regrets that other nations have done so little in this important field. Since it became generally recognized that the statistical treatment of massed data could not be expected to solve the fundamental problems of aetiology there has been a tendency in scientific circles to depreciate the value of statistical study in cancer research. Actually there is room for ancillary investigation. This subject of social cancer, as it has been called, is one of the fields to be explored. Dr. Stevenson's work here was of first-rate importance, and should encourage others.

Since cancer as a cause of death mainly affects persons at a time of life which allows, or enforces, leisure for reflection and even literary composition, it is natural that discussion of the subject should be extensive. A special merit of Dr. Cramer's paper is that it puts the subject into correct perspective. Not only does it hold out hope of further advance by means of investigations within the competence of many people, but it certainly does not suggest that the (relatively) aged of to-day are much worse off than their grandparents.

A DIETARY SURVEY

The report on a dietary survey in terms of the actual foodstuffs consumed, by Professor E. P. Cathcart and Mrs. A. M. T. Williams, recently issued by the Medical Research Council,[1] is a document that repays close study. It contains some information that is astonishing and whets the desire for knowledge regarding the state of health of those whose diets are low in the so-called "protective" foodstuffs; knowledge which, it is to be hoped, the Medical Research Council may soon be in a position to provide.

"In the present report the authors bring together the figures obtained in their earlier investigations made at St. Andrews, Cardiff, and Reading, and analyse them from a new angle. In the earlier reports attention was in the main directed to the nature of the food consumption in terms of protein, fat, and carbohydrate, irrespective of the sources from which these principles were derived. In the present report these data have been interpreted in terms of some of the principal foodstuffs purchased in the course of everyday house-keeping. The results of studies of the type of food eaten by a number of Glasgow families, and also by some women students, have been added to those obtained in the other localities. Thus it is evident that a view of the actual foods eaten by a fairly large section of the population has been obtained in this work."

This view is given in the form of summaries of the foodstuffs consumed by the families in their various social and other groupings. It is a view of the average diet in each group, but one showing little or no detail of the diets falling below the average. We read that "few of these diets from the standpoint of energy, protein and fat content, percentage of 'first-class' protein, and mineral salts can be regarded as really poor, far less hopelessly inadequate, but at the same time many of them, particularly with reference to their content of 'protective' foodstuffs like milk, green food, and fruit, leave much to be desired." We are told of families in Glasgow whose intake of calcium per man per day is as low as 0.28 to 0.34 gramme, of phosphorus as low as 1 gramme, and of iron as low as 10 milligrammes; and we wonder what the state of health of the women and children of these families is. We learn that the daily intake of calcium by a group of apparently healthy women students showed individual variations ranging between the high figure of 1.974 grammes and the low one of 0.257 gramme, and curiosity is aroused as to how a woman whose diet provided less than one-third of a gramme of calcium daily would react to the strain of pregnancy or of influenza. Searching through the tables giving summaries of the foodstuffs consumed by the unemployed and by the unskilled workers we are left with the impression that the diets of some families in these groupings must be very low in fat-soluble vitamins. Of fifty-three families, drawn mainly from the less-well-paid section of the inhabitants, consuming on the average 3,096 Calories per man per day, no less than 1,986, or 64 per cent., of Calories were derived from foodstuffs—meat, bread, and sugar—poor or completely lacking in vitamin B_1. We wonder what effect the low intake of vitamins is having on the children of these families. We learn that comparatively little use is made of such excellent foodstuffs as legumes, skimmed milk, butter-milk, and cheese, that the consumption of sugar is high, and that the use of brown bread is an evidence of social status. We read that the weekly expenditure on food per man of the unemployed class in St. Andrews is 6s. 2d., with a standard deviation of 1s. 4d., and we wonder how the diet of a family spending the sum of 4s. 10d. per man per week is constituted.

The authors consider that the usual allowance of 10 per cent. for refuse and waste is much too high, that 5 per cent. is nearer the mark, and that even this is on the high side. Though poverty is to-day commonly regarded as the primary cause of inadequate nourishment, they are of opinion that "the main causal factor of inadequate diets in many households is ignorance of how to buy, what to buy, and how to use to the best advantage the material bought." This is, of course, not to say that lack of means plays no part; "such an assertion would be merely futile." A large percentage, we are told, tend to purchase items of a luxury nature rather than those of an essential type. "Too often there is an excessive expenditure at the beginning of the week on tasty foodstuffs that give a poor return per penny spent and a period of bare maintenance later. Balance of expenditure is an art unknown or ignored by many." The authors express regret that such a state of affairs should exist in a country like ours, and ask the question: How can things be improved? They do not believe the difficulty to be solely of an economic nature; "the problem is far more complicated than some would-be reformers imagine." They disagree with "those who imagine that they can alter the dietary habits of our people by direction or dictation. . . . It is not dictation but education which is required." They conclude a most interesting, instructive, stimulating, and curiosity-exciting report with the words: "The fact remains that although improved economic conditions may play a part in the amelioration of diets the greater universal good will be attained by educational means."

[1] Special Report Series, No. 218, Medical Research Council. London: H.M. Stationery Office, 1936. (1s.)

GONOCOCCUS ANTITOXIN

We publish in this issue a very favourable report by Dr. T. Anwyl-Davies on the treatment of gonorrhoea with an antitoxic serum. The starting-point of the work which has led to the adoption of this treatment was an attempt by Corbus[1] to prepare a Bezredka "antivirus" for active immunization in gonorrhoea. His difficulties with culture media led him to consult Dr. N. S. Ferry, who supplied him with the culture filtrate which constitutes an "antivirus" in Bezredka's sense, and this material appears to have been extensively used for treatment, although not with uniformly good results: a recent report by Deakin[2] distinctly condemns it. Meanwhile Clark, Ferry, and Steele,[3] who had prepared this material, were investigating its properties on their own account, and came to the conclusion that it was not "antivirus," but that it contained an exotoxin. The validity of this conclusion is of vital importance, not only because it is the whole theoretical basis of the present serum treatment, but because these methods of investigation were then applied to a closely related organism—the meningococcus. In a subsequent series of papers[4] these authors claim also to have demonstrated the existence of a meningococcus exotoxin: the new serum treatment for cerebro-spinal fever to which these investigations have led is already more familiar than the corresponding treatment for gonorrhoea. In each case the chief item of evidence for the existence of an exotoxin in culture filtrates is that dilutions of these filtrates will produce skin reactions analogous to the Schick and Dick reactions, which are prevented by immune serum. The principal objection to accepting the exotoxin hypothesis is that gonococci and meningococci are notoriously subject to rapid autolysis, and during the four days or more of growth which precedes filtration so much intracellular material must be liberated by actual lysis that the secretion of toxin by living cocci is simply incapable of proof. Although in a sense this question is mainly of academic interest, it is deeply involved when we come to consider appropriate methods of titrating an antiserum. Everyone interested in this matter is agreed that it is in a highly unsatisfactory position. Should living meningococci be used in protection tests, or suspensions of dead cocci, or culture filtrates, and by what route should they be administered in what animal? It may be observed here that Miller and Castles[5] have added another to possible methods of this kind by their observation that meningococci will multiply freely in the peritoneal cavity of mice if mucin is added to the inoculum, and thus produce something more resembling a natural infection.

These considerations may appear rather remote from the subject of Dr. Anwyl-Davies's paper, but they have in fact an important bearing on it. His opinion of the clinical value of gonococcus antitoxin is decided and will command respect. The wider adoption of this treatment, or of the treatment of cerebro-spinal fever with the same type of serum, must lead to the production of these sera in other laboratories than those from which the present supplies have emanated, and will demand, as indeed all recognized forms of serum treatment demand, that there shall be accepted standards of therapeutic activity and accepted methods of verifying them. These standards and methods do not exist. The effect of Dr. Anwyl-Davies's report may well be to stimulate a wider interest in this subject, and to induce others to study the mechanism of the results he has observed: this is certainly a matter calling for the services of a larger field of investigators than have so far been engaged in it.

[1] *J. Amer. med. Ass.*, 1932, **98**, 532.
[2] Ibid., 1936, **107**, 954.
[3] *J. Immunol.*, 1931, **21**, 233.
[4] Ibid., 1931, **21**, 293; 1932, **23**, 315; 1934, **26**, 143.
[5] *J. Infec. Dis.*, 1936, **58**, 283.

PROSTAGLANDIN AND VESIGLANDIN

The demonstration of the presence in various tissues of substances, other than hormones, with active pharmacological properties is now familiar. The most recent addition to the list of active agents of this sort is that described in 1933 by M. W. Goldblatt[1 2] and about the same time by v. Euler.[3] The former detected it in human seminal plasma, and the latter has lately demonstrated its presence in the secretion and extracts from the prostate and seminal vesicles of man. It was possible to show that the substance, called "prostaglandin" by v. Euler, is distinct from all other known active principles extracted from tissues. V. Euler at first thought it was identical with the P-substance extracted by himself and Gaddum from horse intestinal muscle and brain tissue, but more recently he agrees that it is a hitherto undescribed substance. The outstanding properties of this new agent are: powerful depressor, vasodilator, stimulant to the smooth muscle of the intestine and uterus. Goldblatt showed that it causes rhythmical contractions of the isolated seminal vesicle. The substance appears to be acid in character and is soluble in water, alcohol, acetone, and in certain conditions in ether and chloroform: it is very stable at *p*H 1 to *p*H 7, but is readily destroyed by alkali and also by free halogen. It produces a large and prolonged fall of blood pressure, which is unaffected by paralysis of the parasympathetic nerves. Its action on smooth muscle is unaffected by atropine, so that it must be regarded as acting directly on the muscle. A similar substance was also demonstrated by v. Euler in extracts of the seminal vesicles and semen of monkeys: he names it "vesiglandin," and shows that in quite definite respects it differs from prostaglandin—for example, it is less stable in acids and alkalis and has relatively a very slight action on smooth muscle. These pharmacologically active bodies exert their effects in very small quantities, and appear to be specific to the genital accessory glands and the seminal fluid. Both the above investigators failed to find the substance in other animals except the sheep (v. Euler). The possible function of such a body in the mechanism of ejaculation suggests itself, but its absence from the seminal fluid and glands of animals other than man and the sheep makes the problem difficult. It is reasonable to suppose that local vasodilatation and

[1] *Chem. Industr.*, 1933, **52**, 1056.
[2] *J. Physiol.*, 1935, **84**, 208.
[3] Ibid., 1936, **88**, 213.

stimulation of smooth muscle plays a part in the processes of nutrition and mobilization of the spermatozoon, but no general conclusions can be drawn until further work has shown whether a chemical agent subserving such a function is present in other animals. Methods of approach other than the rather direct ones used hitherto will probably be necessary. More knowledge, for example, is needed on the comparative physiology of the accessory genital organs and the processes of ejaculation. It may be that in some animals the nervous control of ejaculation predominates, so that the accessory effects of chemical substances such as prostaglandin are relatively unnecessary.

A STUDY OF TETANUS

We have referred before[1] to the work of Abel and others, who have sought in a series of papers to demonstrate that tetanus toxin is blood-borne and not carried to the cord along nerves, as has been believed for many years. Abel, Evans, and Hampil[2] have now published a further paper of great length in which this belief is reasserted, although a description of certain experiments bearing most directly on this specific question is again deferred to a later publication. The study reported here was carried out mainly by the orthodox and laborious method of injecting toxin into a large animal, such as a sheep, and tracing its subsequent fate by bio-assay—that is, the injection of varying amounts of blood or organ suspensions into smaller animals. This series of experiments is held to support several conclusions in which the nerve transport theory finds no place. Briefly stated they come to this—that an exact minimum lethal dose of toxin is absorbed and fixed by susceptible tissues, any excess over this amount remaining in the blood and lymph. This supposition would certainly account for the fact that in natural tetanus toxin is sometimes to be found in the blood and sometimes not. The "irretrievable fixation" of a lethal dose of toxin by the tissues takes place within five hours of intravenous injection, and thereafter the fatal course of the disease is predetermined. Toxin thus fixed is irrecoverable—that is, an organ containing its quota of a lethal dose is nevertheless harmless, after perfusion, to other animals. This is a fundamental and very interesting observation, which, if correct, invalidates a great deal of previous work, for it simply means that the estimated toxin contents of organs have been a function of their vascularity, and the comparatively bloodless condition of the cord itself post mortem explains the negative results of many attempts to demonstrate the presence of toxin in it. Suggestive as these observations are many will feel that this matter is still *sub judice*. There are arguments in favour of the nerve transport theory which remain unanswered in Abel's work, and everyone who has read these papers will hope that in the next he will withhold none of the experimental data on which his conclusions are based. No one will now dispute that tetanus toxin can be blood-borne, especially when large amounts of the preformed toxin are injected experimentally, but under the somewhat different conditions of the natural disease the hypothesis of neural spread still appears to fit some of the facts better than any other.

[1] *British Medical Journal*, 1935, **1**, 1229.
[2] *Johns Hopk. Hosp. Bull.*, 1936, **59**, 207.

EVIPAN FOR DELIRIUM TREMENS

Luckily it does not very often fall to the lot of the general practitioner to have to treat cases of violent delirium tremens, but when it does so happen he will turn with especial gratitude to any drug which offers hope of quieting the patient and terminating the attack. Few cases can present greater difficulties than these—a hallucinated, struggling, shouting patient, almost impossible to feed, requiring two or even more attendants, with perhaps a cardiovascular system threatening to break down, and often seemingly quite uncontrolled by even massive doses of the customary sedatives. Dr. P. Sperber[1] now reports three cases that he has treated at an American penitentiary by the intravenous injection of sodium evipal (evipan). Like other physicians he has often found even large doses of morphine or paraldehyde to be useless in outspoken delirium, though a strong mixture of bromide and phenobarbital might prevent an attack developing. In the cases described a solution of 1 gramme of sodium evipal in 10 c.cm. of sterile distilled water was made up (that is, 10 per cent.) and 2 c.cm. was first injected slowly into the vein. As might be expected, this is no easy matter in delirium tremens, and in one case six attendants were required to hold the patient reasonably still. Almost as soon as the injection (2 c.cm.) was given the patients relaxed, yawned, and dropped off into a deep sleep; after this 1 c.cm. more was injected. All these patients slept, with only one short break, for from eighteen to twenty-four hours, after which they woke fully orientated and sensible, and with no recollection of the attack. Such prolonged sleep is not unusual at the end of an attack of delirium tremens, apart from any specific drug effect, but these results are certainly striking in the remarkable cessation at once of so serious a condition. It is of course unwise to judge the value of any form of treatment on the results in three cases only, but it would appear hopeful that in sodium evipal a drug of real value in delirium tremens may be available. Its use in further cases is certainly justified, and results will be awaited with interest, though it is to be anticipated that with careful preventive measures and proper judgement in the sudden withdrawal of alcohol in addicts the incidence of delirium tremens will gradually be still further reduced.

THE EGG MEMBRANE TECHNIQUE IN VIRUS WORK

When Woodruff and Goodpasture[2] demonstrated six years ago that filterable viruses could be grown on the chorio-allantoic membrane of the developing egg they gave to virus workers a new technique which bids fair to be of supreme importance in this line of research. An increasing number of workers have made use of this method, and it has been clearly shown not only

[1] *New England J. Med.*, 1936, **215**, 1065.
[2] *Amer. J. Path.*, 1931, **7**, 209.

that a considerable number of viruses can be cultivated on the developing egg, but also that this new technique is available for accurate virus titration, the detection of viral antibody in sera, and cross-immunity experiments. The chorio-allantoic membrane can, in fact, replace the experimental animal almost entirely in the study of many viruses. For much of this knowledge we are indebted to Dr. F. M. Burnet. Many of the papers published by him during the last two or three years have been devoted to this aspect of virus research, and he now gives us the fruit of this extensive experience in a report to the Medical Research Council.[3] Here will be found set out with admirable clarity the technical details of this method and information concerning the various human and animal viruses which can be grown and studied in this way. Many of the observations published in this report have not appeared elsewhere, thus adding considerably to its value. The advantage of this new method is not merely that the egg is cheaper and less troublesome than using animals; it does away with many defects inherent in the latter method. No longer need the worker fear that the activation of dormant infections or the occurrence of cross-infections will intervene to ruin his experiments, for the egg membrane technique is free from these defects. Further, as Burnet points out, the egg can be employed for the production of bacteriologically sterile virus for immunization purposes; already vaccinia virus grown by this method has been used for the vaccination of man. And since these cells of the chorio-allantoic membrane are susceptible to such a surprising variety of viruses, it is perhaps not too optimistic to hope that the list will be extended to include some human viruses which have resisted transmission to animals and so very largely eluded study.

PLAGUE IN PARIS

The history of plague, its epidemiology, and the discoveries in regard to its transmission, upon which are based our measures of prevention, make some of the most fascinating reading in medicine. A hitherto unwritten chapter in the story of the disease, by Joltrain (Médecin Inspecteur des Epidémies), has now been published[4] in which is given an account of the outbreak of plague in Paris towards the end of the war. On December 3, 1917, a child was admitted to Brettoneau Hospital suffering with an axillary bubo, from which by gland puncture an organism morphologically identical with *B. pestis* was recovered. As no case of plague had been reported at the time (Paris had been immune from the disease for nearly 300 years), and as the patient died immediately afterwards, no further investigations were carried out and the facts were not recalled until June, 1920, when a similar case came under observation, and the organism was definitely identified at the Pasteur Institute. Joltrain was then placed in charge, notification was put into effect, arrangements for anti-plague inoculation of all contacts instituted, and a method of diagnosis by a fixation reaction devised. Four foci were discovered in the suburbs lying to the north of Paris, from west to east—Levallois, Clichy, Saint-Ouen, and Pantin. The total number of cases notified in 1920 was 106, in ninety-one of which the diagnosis was confirmed. Among fifty-two cases treated with anti-plague serum the mortality was 6 per cent.; among the untreated, 80 per cent. Those affected belonged for the most part to the very poor class, miserably housed in rat-infested quarters, and employed in the rag-and-bone trade. In the years 1921, 1922, 1923, and 1924, ten, five, seven, and eleven cases occurred respectively, with odd cases in the subsequent ten years, but none in 1935 and 1936–7. That rat epizootic persists at the present time is almost certain, though no infected animals have been found since 1934. In a footnote to the article a source of difficulty in this work is mentioned, one which is not present in this country. As soon as rats were caught in traps set down by the sanitary authority they were immediately taken and sold by the local inhabitants for three or four francs apiece to the "ratodromes." Few of our readers, perhaps, are familiar with these rendezvous, where one may back one's fancy among rat-killing terriers. The author appears to believe that the epidemic had origin in the escape of infected rats from a boat which arrived in the Seine near Paris from India, having picked up a cargo of coal in England en route. This suggestion, however, should be received with reserve; the facts do not appear to warrant this belief.

[3] Medical Research Council Special Report Series, No. 220. London, 1937. H.M. Stationery Office.
[4] *Bull. Acad. Méd.*, Paris, 1936, **116**, 601.

A DISCLAIMER

Various members who have communicated with the British Medical Association regarding approaches made to them by representatives of the Consolidated World Research Society have stated that such representatives informed them, apparently as an inducement to them to purchase the *Consolidated Encyclopaedia* and to subscribe to the so-called "research services," that the society is recognized by the British Medical Association. If the use of the word "recognized" is intended to connote approved, we desire to make it clear that there is no justification for this statement. Moreover, many members have informed the Association that they signed the society's contract in the belief that they were purchasing an encyclopaedia of medical knowledge. Such is not the case: indeed, the society in one of its letters writes as follows: "We do not understand the comments contained in your letter and reply, as the books themselves do not purport in any way to be medical or surgical." In December last the Consolidated World Research Society Limited instituted proceedings against a medical man practising in Sussex claiming the sum of £18 said to be due under a contract signed by this doctor for the supply of the "*Consolidated Encyclopaedia.*" The conduct of the defence was assumed by the Medical Defence Union, and a defence was filed repudiating liability on the ground that the defendant had been induced to enter into the contract "by fraud and wilful misrepresentation by the plaintiffs' representative." A few days before the date for the hearing notice was given on behalf of the plaintiff of the withdrawal of the claim. We think it desirable that these facts should be brought to the knowledge of the profession.

ENDOCRINES IN THEORY AND PRACTICE

This article is one of a series on Endocrinology contributed by invitation

THE ADRENO-GENITAL SYNDROME AND TUMOURS OF THE SUPRARENALS

BY

A. W. SPENCE, M.D., M.R.C.P.

Tumours of the suprarenal glands of clinical importance may be conveniently classified as follows:

CORTEX

Innocent: Adenoma.

Malignant: Hypernephroma.

Both may be associated with the adreno-genital syndrome.

MEDULLA

Innocent: Phaeochromocytoma (hyperchromaffinism)—associated with paroxysmal or continuous hypertension.

Malignant: Neuroblastoma, causing clinical features of (*a*) Pepper type; (*b*) Hutchison type.

The Adreno-genital Syndrome (Adrenal Virilism)

The adreno-genital syndrome is a reversion to masculinity, associated with carcinoma, adenoma, or simple hyperplasia of the suprarenal cortex, but these cortical changes are more often present without any somatic or sexual disturbances. On the other hand, in some cases of the syndrome the glands may be apparently normal. The clinical manifestations depend on the type of lesion and on the time of onset. Malignant tumours are associated with more rapid changes than benign tumours of slow growth or simple hyperplasia. The disease may arise at any age, even developing *in utero*, but when it supervenes during the period of rapid growth of the individual—for example, up to puberty—the changes will be more marked than when growth is not so rapid—for example, after maturity. For this reason it is convenient to describe the condition as it occurs in different age groups, but it must be realized that there is no definite demarcation between each group and that each picture merges gradually into the other. It is pre-eminently a disease of the female sex and afflicts males only during childhood. It may be divided into four main clinical types: those which arise—(1) during foetal life; (2) before puberty; (3) after puberty; and (4) after the menopause.

DURING FOETAL LIFE

When the disorder arises before sexual differentiation the changes are those of feminine pseudo-hermaphroditism. Externally the bodily configuration approaches the male type, with perineal hypospadias, a large clitoris peniformis, and a vulva-like cul-de-sac. Internally a uterus and ovaries are present. When it appears later in foetal life these changes are less pronounced: a large clitoris and hypospadias are present; there may be growth of hair on the face, axillae, and pubes; but the uterus and ovaries are atrophic.

BEFORE PUBERTY

Manifesting itself during this period the condition is one of precocious puberty.

In girls statural growth increases and the configuration of the body may approach the male type; the voice may deepen and there may be a growth of hair of male distribution—that is, on the face, in the axillae, on the legs and forearms, and on the pubes extending towards the umbilicus. They may become obese, but the obesity is not that of childhood, but of the plethoric type seen in middle age. As a rule the mentality is consistent with the true age of the patient, but occasionally there may be retardation of mental development or even severe mental disorder. The external, but not the internal, sex organs develop precociously, especially the clitoris, which is hypertrophied. Although the condition is termed "pubertas praecox" it is in effect a false precocity, as it is most uncommon for these patients to menstruate. Ossification and dentition are often hastened, but as the epiphyses join earlier than usual their height is eventually less than normal. Excessive muscular development, as in the male counterpart, is not generally found.

In boys there are also increase in growth, deepening of the voice, and excessive growth of hair. Ossification and dentition are hastened, with early union of the epiphyses. The external genitals are greatly enlarged, resembling those of an adult, but usually there are no sexual changes such as libido. In some cases, however, there may be increased sexual activity. In one group there is a generalized obesity of the plethoric type; in another excessive muscular development and strength, described by Parkes Weber as the infant Hercules type; in others obesity and muscular development may be combined. Finally the patient may become enfeebled through muscular wasting, develop a prematurely aged appearance, and die at an early age.

AFTER PUBERTY

In adults the adreno-genital syndrome is practically confined to women, occurring most often between the ages of 18 and 25. One of the most troublesome symptoms in these patients is the hirsuties, which may be slight in some but very marked in others. It is characteristically of the male type and may be widespread in its distribution. It appears most commonly on the face as a beard and moustache, and on the forearms, thighs, and legs; the hair in the pubic region spreads upwards in a triangular fashion to the umbilicus, and may even cover a large part of the abdomen. It may appear on the chest between the breasts, around the nipples, and on the back. In older women the hair of the scalp may fall out, particularly in the frontal region.

In some patients the voice deepens, the breasts atrophy, and the body tends to become masculine in appearance, but not to the same extent as in children, in whom feminine characteristics have not fully established themselves before the onset of the disorder. Other sufferers may become rapidly and excessively obese, with supraclavicular pads of fat, large pendulous breasts consisting mainly of fatty tissue, and folds of fat on the abdomen and back. In these patients there may be purplish cutaneous striae situated over the lower abdomen. At first menstruation becomes scanty and irregular, and later there is amenorrhoea, which is often accompanied by pains in the pelvis, nausea, and vomiting. As in the other age groups the clitoris is often enlarged.

Psychological changes may be a marked feature, although these are unusual. Langdon-Brown and Girling Ball have reported a case of a woman whose earliest symptom was an obsessional neurosis that she was

changing into a man, which produced in her a state of terror. There may be a lack of modesty, a masculine outlook, an indifference to or a complete loss of sexual desire, and in a few deviation of the sexual instinct to homosexuality.

There may be acneiform eruptions, and, rarely, greyish spots of pigmentation on the forehead, axillae, and back. An abdominal mass may sometimes be palpable in those cases associated with a tumour. It is unusual to find metastases, but when they occur they are situated in the bones, lungs, and liver. Occasionally there is osteoporosis. There may be vascular hypertension, hyperglycaemia, and glycosuria. The basal metabolic rate, which varies considerably, is often slightly increased.

AFTER THE MENOPAUSE

The clinical picture in these cases is not so well marked, as hirsuties may be absent. Obesity is common in most patients, who occasionally suffer from menorrhagia.

Diagnosis

A palpable tumour in the renal region is good evidence that the disturbance is of adrenal origin; in many cases, however, no such sign is present. Recently a method of demonstrating the suprarenals by *x* rays has been devised. Air is introduced into the perirenal fascia and its position observed by means of an *x*-ray film. The mass of air is then forced by manual pressure into the tissues surrounding the suprarenals. The best results are obtained by an *x*-ray film taken eighteen to twenty-four hours later. By this means suprarenal enlargement may in some cases be detected. Another method is to determine the position of the kidneys by *x*-ray examination after intravenous uroselectan.

The diagnosis of precocious puberty as a manifestation of the adreno-genital syndrome may be difficult in the absence of a palpable adrenal tumour, and the condition must be differentiated from those cases associated with pineal tumour, lesions in the region of the hypothalamus and mid-brain, ovarian granulosa-cell tumour, and testicular tumour, all of which are extremely rare. In girls a reversion to the masculine form, hirsuties, and amenorrhoea are in favour of an adrenal origin. Pineal tumours are not as a rule associated with virilism and occur in boys, whereas adrenal virilism is commoner in girls. In addition to increased skeletal growth, precocious development of the external genitals, and obesity, pineal tumours may give rise to such disturbances as somnolence, psychological changes, deafness, blindness, ocular palsies, and symptoms and signs of increased intracranial pressure. Localizing signs may also be present in cases of tumour in the region of the hypothalamus and third ventricle. Granulosa-cell tumours, which arise from granulosa-cell rests in the ovary, have a feminizing influence. They are generally unilateral, vary considerably in size, and usually occur in elderly women, in whom they cause uterine bleeding. In the few cases which have been described in children they produce a precocity characterized by increase in skeletal growth, premature development of the feminine form, premature growth of the mammary glands, external genitals, and uterus, and periodic uterine bleeding. The precocious appearance of axillary and pubic hair has also been observed. It must be noted that in the false precocity of the adreno-genital syndrome premature development of the mammary glands and uterine bleeding are rare features.

When the obese type of the adreno-genital syndrome appears in adults the most important condition from which it has to be distinguished, if this be possible, is Cushing's syndrome, a pluriglandular disturbance ascribed by Cushing to an increase of the basophil cells of the anterior pituitary with secondary adenomatous or hyperplastic changes in the suprarenal cortex. The group of cases of pluriglandular disease described by Achard and Thiers as "diabetes of bearded women," and characterized by hirsuties, obesity, amenorrhoea, hypertension, cutaneous striae, and glycosuria, have features similar to those of Cushing's syndrome. In the cases that came to necropsy pituitary or adrenal tumours were found. It is disputed whether such cases should be considered examples of Cushing's syndrome or are types of the adreno-genital syndrome. Cases of the adreno-genital syndrome have been described which were practically identical with Cushing's syndrome and in which at necropsy an adenoma of the adrenal cortex was found and no increase in the basophil cells of the anterior pituitary. Langdon-Brown, two years before Cushing described his syndrome, remarked on the similarity of the signs produced by lesions of the anterior pituitary and the adrenal cortex. Clinically, and even pathologically, it may be impossible to reach a definite conclusion.

Masculinization is also caused by the rare ovarian tumour termed "arrhenoblastoma," which arises from undifferentiated cells in the rete ovarii and has the structure of testicular tubules. In women with this tumour menstruation ceases and the breasts atrophy, there is a considerable growth of hair on the face, and sometimes on the chest, abdomen, and extremities, the clitoris enlarges, the voice may become deeper, and the configuration of the body approaches the masculine type.

Treatment

Laparotomy should be performed, and if a suprarenal tumour is found it should be removed. When a tumour is not found, Broster removes the larger suprarenal, with good results in post-pubertal virilism. Within a few days of the operation the excessive hair begins to be shed and can be pulled out with little or no pain. The mental outlook changes to the feminine type, the breasts develop, and normal menstruation returns. The results in prepubertal cases are disappointing, probably because the changes are more fundamental and long-standing. Some patients with precocious puberty, however, have improved after the operation—hair growth has become normal, the obesity has diminished, and the body has assumed more childlike form; but in a recent case of precocity in a boy of 5 the external genitals did not diminish in size.

Medullary Tumours

Phaeochromocytoma (*Hyperchromaffinism*).—This form of tumour, which is somewhat rare, is usually not malignant, and consists of highly differentiated chromaffin cells which secrete adrenaline or some allied compound. About half of the cases are associated with paroxysmal or continuous hypertension. A paroxysmal hypertensive attack is characterized by the sudden onset of dyspnoea, tachycardia, headache, pallor, and a feeling of constriction about the heart and epigastrium, often accompanied by nausea, vomiting, and apprehension. There may be glycosuria and hyperglycaemia. Pulmonary oedema may occur, and coma due to hypertensive encephalopathy. Sudden death has been reported in some instances. At the height of an attack there may be a sudden fall of blood pressure, which is accompanied by flushing of the face, contraction of the pupils, profuse sweating, and salivation. A tumour may be palpable in the renal region, or displacement of the kidney by a tumour mass may be

observed on *x*-ray examination. Paroxysmal hypertension may eventually become persistent, and hypertensive crises may supervene in continuous hypertension.

Neuroblastoma (*Sympathoblastoma*).—These tumours appear very early in life and arise from the sympathetic ganglion cells. They are highly malignant and were formerly regarded as sarcomata. They are divided into two main types, but the histology is essentially the same in each. The type described by Pepper occurs in the youngest infants, and is characterized by metastases in the liver, lungs, and abdominal glands. In these cases the primary growth is more often situated in the right suprarenal, which may be palpable. In the Hutchison type the primary tumour is more usually in the left suprarenal and metastases appear in the cranium and behind the orbit, causing proptosis and papilloedema, and simulating the clinical picture of chloroma and of intra-orbital haemorrhage in scurvy.

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A David Anderson-Berry gold medal, together with a sum of money amounting to about £100, will be awarded in July, 1938, by the Royal Society of Edinburgh to the person who, in the opinion of the council, has recently produced the best work on the nature of *x* rays in their therapeutical effect on human diseases. A similar award will be made every three years. Applications for this prize are invited. They may be based on both published and unpublished work, should be accompanied by copies of relevant papers, and must reach the general secretary, Royal Society of Edinburgh, 22, George Street, Edinburgh, 2, by June 1, 1938.

WOMEN'S WELFARE AND BIRTH CONTROL

DEPUTATION TO MINISTER OF HEALTH

Sir Kingsley Wood, the Minister of Health, received on February 2 a deputation organized by the National Birth Control Association, representing twelve societies interested in the subject of women's welfare and birth control. The deputation was introduced by Lord Horder, and the other principal speakers were the Countess of Limerick, Dr. Jocelyn Moore, Mr. Cedric Lane-Roberts, Lady Denman, and Mrs. Freeth.

The deputation urged that the present provision of gynaecological clinics to deal with the medical care of married women, at which advice on contraception would be available to those women for whom further pregnancy would be detrimental to health, was inadequate and that but little exercise had been made by local authorities of the powers which they possessed in the matter. Increased provision was very necessary, and it would lead to a reduction not only in maternal morbidity and mortality, but in criminal abortion, which was due to the need felt by women to escape pregnancy on medical and other grounds.

The Case for More Clinics

The deputation urged the Minister to issue a circular to local authorities encouraging them to establish gynaecological clinics in which birth control should take its proper place as part of the general medical care of women, and indicating the lines on which the clinics should be run. The deputation attached great importance to the work being carried out as an integral part of the maternity and child welfare schemes of local authorities.

The Minister's Reply

Sir Kingsley Wood said he recognized the force of many of the arguments that had been advanced by the deputation, but that both Minister and local authorities were bound to observe the limitations imposed by Parliament on their activities. The local authorities, for instance, had at present no legal power to provide birth control clinics as such, and there was no statutory duty upon them to provide advice or medical assistance in relation to birth control. There were still differences of opinion, and in a matter of this kind particularly it was necessary and right that the legislative position should be fully maintained, and if any alteration in policy was made it should receive Parliamentary approval.

The Maternity and Child Welfare Act empowered local authorities to make arrangements for attending to the health of expectant mothers and nursing children under school age. A clinic provided under the Act could not, therefore, lawfully be used for any woman who was not an expectant or nursing mother. Such clinics were not primarily intended for sick women. In fact the object of the Act was preventive, and expectant and nursing mothers were encouraged to attend these clinics in order that sickness should, if possible, be avoided.

Existing Clinics

There were also the clinics provided under the Public Health Acts, and their functions were different from those of the maternity and child welfare clinic. They extended only to the provision of hospitals or clinics for the reception of sick persons, but any sick woman might attend such hospital or clinic for advice and treatment. Apart from the clinics for ante-natal or post-natal supervision of expectant or nursing mothers and clinics for the treatment of women who were sick, there was no statutory authority for the establishment of clinics providing for the facilities suggested by the deputation.

Sir Kingsley Wood emphasized that the maternity and child welfare centres were not ordinarily designed or

equipped for general gynaecological work or as a place for the treatment of sick women. But if they were the result might be that their preventive functions would be impaired by being mixed up with work which usually needed the resources of a hospital for its adequate performance. He did not therefore think that in ordinary circumstances it was desirable that a gynaecological clinic should be established at a maternity and child welfare centre, though he recognized that some local authorities with their knowledge of local conditions might feel justified in taking a different course.

Report Awaited

With regard to the encouragement of further gynaecological clinics, Sir Kingsley Wood said he hoped shortly to receive the report of the last two years' investigation into the problem of maternal mortality. He had little doubt that one of its most important recommendations would relate to the need for an extension of post-natal clinics. At these clinics facilities would be available for medical examination and certain minor forms of treatment for women who had recently been confined, and birth control advice could lawfully be given there to any such woman in whose case pregnancy would be detrimental to health, but it was desirable that such advice should be given at a separate session. The establishment of post-natal clinics would no doubt show the need in many areas for providing gynaecological clinics for the treatment of disabilities and diseases which were discovered at the post-natal clinics and which could not be adequately treated there. These gynaecological clinics must be provided under the Public Health Acts, and they would be available for any woman suffering from gynaecological conditions, and birth control advice could lawfully be given at such clinics to any woman for whom pregnancy would be detrimental to health. He thought that the most suitable place for a gynaecological clinic was a women's hospital or a general hospital, but he would carefully consider all that the deputation had said and what should be included in the circular to local authorities following the recent investigation into maternal mortality, and particularly on the need of gynaecological clinics to supplement the work undertaken at post-natal clinics.

With regard to the subject of abortion, he had no doubt the report on maternal mortality would deal with this question, and he would have to consider what action was desirable in the light of the report.

THE MEDICAL ILLUSTRATOR

AN ALLIANCE OF ART AND MEDICINE

The article printed below has been written by a professionally trained technical artist in London.

The anatomical illustration of medical subjects has a history that reaches from pictorial antiquity up to the present day. It ran parallel with some of the oldest manuscripts, and, like them, developed laboriously out of necessity for a clearer representation of facts. The rudiments of this art lay either in the hands of a draughtsman who knew nothing of the actual subject or in those of an anatomist who had no feeling or power of artistic expression. As long as these two did not see eye to eye the result was disastrous. In the former case the drawings, though pleasing to look at, were often utterly misleading; in the latter case the forms depicted were not only ugly but incomprehensible to all save the author, who tried to overcome his handicap by lengthy text descriptions. Examples are to be seen of course in any of the earlier medical books.

At the end of the fifteenth century, when the curiosity and attention of the artists awakened to form, they sought the solution of their problems in a close observation of nature, and were compelled to perform dissections of domestic animals and the human body. Medical men, seeing the work of the artists, were urged to more careful and accurate study; they became forced to trust their own interpretations and break away from the Galenical traditions which had enslaved them for three centuries. Vesalius, the father of present-day anatomy, employed Jan Van Kalkar (a skilled artist and a pupil of Titian), and by constant supervision, directing the eye, the hand, and the intelligence of the artist, a pleasant union of the two subjects was formed.

A Twofold Field

It has taken the medical profession centuries to realize the obvious fact that skill and knowledge in this dual field of illustration should not be separated; the one must be animated by the other, and the two harmoniously combined. Even to-day this has not been fully appreciated. In England and France throughout the great hospitals, clinics, and medical schools there are very few professionally trained technical illustrators; apparently their necessity is not admitted, and on looking through the periodicals one might surely wonder why such crude figures have been introduced at all. Germany appears first to have realized the advantage of such artists; its medical books hold high place, for though many practitioners may have difficulty with the text the pictures are so graphic and precise that they are self-explanatory. America stands on a par with Germany, and many of its books published during the last thirty years are beautifully and clearly illustrated. We are not here criticizing the excellent figures in purely anatomical textbooks so much as those of the modern wider world of clinical books and articles, though the complete artist must be capable of handling both specialties.

Photography has invaded this field to a certain extent, but the camera, even in competent hands, can only reproduce what is exactly placed before it. It cannot repair an artefact or reconstruct a whole specimen where a section has been removed for pathological analysis; it has not the power of intelligent selection or elimination of unessential points, nor can it explain a mechanical change of events in the way that an artist can by a well-planned diagram. Likewise, photographs of soft post-mortem tissues are seldom satisfactory; such specimens can best be illustrated by a reconstructed drawing. Further, when it is not possible to photograph an actual subject, a drawing can show the variations which may occur in one disease and help to distinguish it from another giving a somewhat similar appearance.

Special Training and Experience Needed

To-day this special profession of medical art is becoming more practised. The training is long and arduous; it requires infinite patience and an inquiring mind. The art student must have drawn from life to the stage where he has mastered an understanding of the form and means of expression; then he must spend a long period of time in the study of the human body under the direction of a competent anatomist and make careful drawings from dissections prepared by himself. He must be familiar with the normal body first, and then the picture presented by the abnormal or diseased, and be able to recognize the gross changes so wrought and distinguish the subtle changes that differentiate one disease from another. His training must include the reading of tissue preparations under the microscope, histological as well as pathological, and he must know their appearance so well that he can recognize and reconstruct an artefact. With experience he can interpret the views he sees through the different "scopes" when examining the retina, the bronchial tubes, the ear drum, etc. He needs a knowledge of surgical technique in order to be able to sketch quickly and make note of what is done during operations; he must know and abide by the strict rules of asepsis that are law in an operating theatre. His visual memory must be trained to observe and accurately record minute detail, and reproduce slavishly even the texture of what he sees. His work

may be often photographic in appearance, but he can save himself from developing into a mere hack draughtsman by his arrangements, his study of light and shadow, and so arrive at pictures which are objects of beauty even to the layman.

It is essential that he should keep up his studies not only by being up to date in the new movements and discoveries in medicine and surgery, but also by a knowledge of the illustrations of his contemporaries; he should pursue his own studies by drawings of the normal living nude, making a careful note of those lines which express character of form, outline of shadow, and solidity of mass, achieving this by attempting to place only the essential points and working with the utmost simplicity. Absolute accuracy enriched with beauty of expression should be his ideal and patience his virtue. His must be a scientific outlook with a healthy curiosity and an urge to do a little research on his own, which helps him to a fresh view of his daily work and saves it from becoming mere drudgery.

Lastly there is great satisfaction in being handed a new manuscript and given *carte blanche* in planning the necessary illustrations, knowing that the artist possesses the full confidence of the author; he takes pleasure in observing and studying the subject-matter until he knows it as well as the author himself; he then proceeds to illustrate it in such a fashion that he can impart the substance of the article even to the most casual observer.

Few people realize the work involved in the making of illustrations for medical books, which the layman gazes at with awe and morbid curiosity and the medical man often passes over too lightly.

INTERNATIONAL UNION AGAINST TUBERCULOSIS

The executive committee of the International Union against Tuberculosis (general secretary, Professor Fernand Bezançon) met in Paris on January 9. The main object of this meeting was to come to a decision concerning the date of the tenth Conference of the International Union, which should have taken place in Lisbon in September, 1936, under the chairmanship of Professor Lopo de Carvalho and which had to be adjourned.

It was agreed to hold the tenth conference in September, 1937, either at the beginning of the month, should it be possible to meet in Lisbon, or at a date to be decided later should the conference have to be held in another city. In their wish to pay due regard to the active and intelligent endeavours of their Portuguese colleagues, who under normal conditions would have been entitled to expect a most successful meeting, the members of the committee expressed the hope that the conference could take place in Lisbon next September, the final decision to be made only towards the end of April or the beginning of May, 1937. The executive committee, on the other hand, decided that the eleventh Conference of the International Union against Tuberculosis should meet in 1939 instead of 1938 in Berlin, subject to the statutory approbation of the next General Assembly of the Union.

The members of the committee were unanimous in expressing their gratitude to the Italian Government for having placed at the committee's disposal six scholarships at the Carlo Forlanini Institute in Rome. They approved the regulations of the Léon Bernard Memorial Fund, according to which a prize shall be awarded every year by the executive committee to the author of an essay on tuberculosis from a social point of view, written in French or in English. Finally, it was decided that the secretariat of the Union would ask the councillor members in the different countries to select certain scientific questions which would be proposed for research and which might eventually be inscribed on the agenda of future conferences of the Union.

PHYSICAL TRAINING AND RECREATION

THE GOVERNMENT MEMORANDUM

A White Paper[1] explaining the Government's proposals for the development and extension of the facilities available for physical recreation and training has been presented to Parliament by the President of the Board of Education and the Secretary of State for Scotland. Opening with the assertion that bodily fitness depends essentially on nutrition and physical training, it recalls that the problem of the first of these is already engaging the attention of Government, and adds that the present memorandum concerns itself alone with the steps to be taken with regard to the second and the financial assistance which is to be made available.

The Present Position

Circulars on physical training in schools were issued early in 1936, stressing the need for more trained teachers, gymnasia, and equipment for games and swimming. It is noted in the memorandum that these recommendations were later endorsed in the report issued by the Physical Education Committee of the British Medical Association. While the machinery for improving the state of things in schools is ready to hand, it is admitted that a great deal remains to be done for those whose daily environment of the office or the factory makes the provision of opportunities for physical improvement particularly desirable. Those that exist at present are provided variously by industrial concerns, local authorities, bodies concerned solely with physical training and recreation, other national associations in the programme of which physical training and recreation are only partly operative, and certain central co-ordinating bodies such as the Central Council of Recreative Physical Training, the National Playing Fields Association, the Juvenile Organizations Committee and the Scottish Juvenile Welfare and After-Care Office, and the National Council of Social Service and the Scottish Council of Community Services.

It is pointed out in the memorandum that without some central co-ordination of effort the provision of facilities for physical training and recreation must necessarily be sporadic and incomplete, and that the funds available from all sources are insufficient to deal with the need of the population. In many areas the local authorities find themselves unable to exercise their existing powers to more than a very limited extent. The voluntary organizations vary greatly in activity in different districts, and their development is often retarded by shortage of funds, especially in the poorer areas, where the need for physical improvement is usually greatest.

Questions of Policy

Certain fundamental questions of policy, it is stated, arise from these considerations, of which the three most obvious are: Should attendance be voluntary or compulsory? Should the scheme be built up anew from the start or should it be based on the development of existing agencies? and What should be included within the scope of physical training and recreation? In view of the many and various objections to a compulsory system it has been decided that a voluntary basis is essential. The aim of the Government is to inculcate a wider realization that physical fitness has a vital part to play in promoting a healthy mind and human happiness. It is a way of life

[1] Cmd. 5364. Obtainable from H.M. Stationery Office, 2d., or 2½d. post free.

and an attitude of mind the importance of which is continuous and not limited to certain years in early youth. The memorandum goes on to state that while it is admitted that a voluntary system involves only gradual development, the Government is satisfied that it represents the only approach likely to achieve success. While a scheme of training operated by the State might secure greater uniformity in the facilities provided, it would not only be wasteful in that it ignored the great amount of work already being done, but it would probably, owing to this very uniformity, fail to attract the enthusiastic support of those for whom it was primarily designed. It is also recognized that the scheme must cover the whole field of physical culture, and include arrangements for increasing the supply of gymnasia, playing fields, swimming baths, and other means of healthy physical recreation as part of a fuller club and community life.

Outline of Proposed Scheme

The memorandum points out that the science underlying physical training is a developing one, and that research on medical and physiological lines is needed, especially since different physical types and temperaments must receive attention. The Government proposes to appoint at once two national advisory councils, one for England and Wales and one for Scotland; their duty will be to survey the field, and to advise as to the needs of development and the way in which these can best be met. These councils will also promote the establishment of local committees, and suggest means of publicity and propaganda. Two grants committees will also be appointed, the members of which will attend meetings of the national advisory councils. These committees will receive and examine applications for financial aid and make recommendations to the two responsible Ministers of the Government. The requisite staffs for the councils and committees will be mainly provided from the staffs of the Board of Education and Ministry of Health or the corresponding Scottish department. The local committees, consisting of representatives of the local education authorities (for higher education in England), of voluntary bodies, and of other persons who have special knowledge and experience, will not necessarily be limited to county or county borough boundaries, but be formed rather in relation to naturally existing larger areas where there are common problems to be met. They will form the channel through which applications for grants are made to the grants committees, and advise how far local assistance will be forthcoming. They will receive proposals from the instigators of new or more extended schemes of physical education in their areas, with information about the financial assistance likely to be required. Since the success of the whole scheme will depend so largely on the efficient working of these local committees, the grants committees will have power to meet approved expenditure on administration by them.

Financial Proposals

Capital grants will be made in aid of projects for the provision of gymnasia and gymnastic equipment, including changing rooms and shower baths, according to the circumstances attending individual cases. They will not be made to central voluntary organizations for distribution, but only in aid of particular local projects. The national organizations may receive financial aid, however, in stimulating and helping the efforts of local voluntary bodies.

The Government proposes to establish a National College of Physical Training, not only to educate leaders, but also to investigate many of the outstanding related physiological problems. While not excluding the admission of women, the main function of the college would be to train men, since there already exist specialist colleges of physical training for women. It may also be found desirable to aid certain university and other training institutions in providing the accommodation needed to give physical instruction on modern lines. The grants committees will have power to recommend grants to the Central Council of Recreative Physical Training to supplement other provision for training courses for leaders and teachers, and this will help to bridge the intervening period before the training college is actively at work. Grants will also be made to the Central Council for providing expert advice as to forms of physical training and recreation; to aid the provision, where necessary, of adequate salaries for teachers and leaders; and to meet the expenses incurred in discharging these duties. Similarly, grants will be made to the National Playing Fields Association, which will be responsible for considering applications and distributing grants in aid of the provision of playing fields, care being taken that these grants shall not overlap the help derived from the King George V Memorial Fund. Money will be available to provide swimming baths in conjunction with the amounts raised for this purpose by local authorities, and also to provide camping sites and other facilities for physical recreation.

A provisional estimate of the sum required for these various purposes is a capital grant of about £2,000,000 spread over about three years, with additional continuing charges possibly in the neighbourhood of £150,000. It is pointed out that the expenditure in the first year will be relatively low, that a considerable time must elapse before training classes can be fully established, as well as before a grant accrues for payment in aid of an approved scheme. There must be some interval before local committees are fully established and in a position to advise upon particular proposals.

Legislative Proposals

Legislation will be introduced to enable the grants committees to make these grants. It will also be necessary to empower legally the local authorities to exercise such comparable powers as they already possess in connexion with their development of housing estates. County councils likewise will be authorized to contribute towards the cost of county district councils in the exercise of their powers under the Bill, including the provision of swimming baths. The limitation of local education authorities to provide or aid the provision of physical and social facilities for persons over the age of 18 only when they are attending an educational institution will be removed. In Scotland the powers of local authorities will be extended so that effect may be given to the various proposals of the scheme.

It is recognized that the provision of such facilities in Great Britain as a whole is at present insufficient in amount and sporadic in its incidence, and is hampered in development by lack of funds. The present scheme has been devised to make good these deficiencies, but it is added that the purpose will not be fulfilled unless every use is made of the new facilities by existing agencies, whether voluntary bodies or local authorities. The task of these organizations will be twofold: to create in the public mind a realization of the value of physical fitness for its own sake, and to provide facilities attractive enough to make an effective appeal to the community.

USE OF HEARING AIDS

THE BEST TYPE OF APPLIANCE

The latest contribution to the study of the use of hearing aids is a report[1] issued by the Medical Research Council on the recommendation of its Hearing Committee. The authors are Dr. A. W. G. Ewing, Mrs. I. R. Ewing, and Dr. T. S. Littler of Manchester University, and the report gives the results of their investigations into the utility of hearing aids for deaf people, and into methods for determining what types of instrument are best suited to particular cases.

The investigation embraces three main problems:

1. How does the ear of a partially or severely deaf patient behave when stimulated by loud sounds, and to what extent can speech be made intelligible to him by amplification?
2. What are the characteristics of the most efficient type or types of aid?
3. What tests will ensure that the patient may be effectively advised as to what, if any, type of aid is suitable to his individual needs?

The first of these is an all-absorbing problem. Teachers of the deaf, otologists, and others have never been able to give a satisfactory answer to the question, "What actually do the deaf hear?" Indeed, there is no proof, even with normally hearing persons, that a sound stimulation such as the ringing of a bell produces identical effects in any two individuals. However this may be, it is still possible by suitable amplification to make speech intelligible to most deaf people.

The authors state: "In so far as the deafness is of a permanent character, no hearing aid can in any literal sense restore to him the capacity to respond to sound over the lost frequency-intensity range." This appears to suggest that no hearing aid is capable of producing an actual improvement in a deaf subject's hearing. Certain workers in this field, however, claim that by regular stimulation for a period of about two hours daily for some months an improvement in hearing is obtained in many deaf people, and substantiate their claim by the difference shown in the audiometric curve before and after stimulation. In order to carry out the tests in this investigation a beat-tone oscillator of National Physical Laboratory type was used for the pure-tone tests. For measuring audibility and intelligibility of amplified speech a Western Electric moving-coil microphone and associated amplifier was used to obtain speech levels which could be controlled. A meter was placed at the output of the apparatus to indicate the output level and thus enable the speaker to maintain a fairly constant speech level. With this apparatus it was possible to control the speech intensity received by the subject, and also to determine his speech threshold.

The Threshold of Audibility

A method of measuring the effective amplification of hearing aids under working conditions was evolved. A clinical examination and report was made in each of the nine subjects who took part in a prolonged series of experiments. Much patient work has been done in these experiments, not only by the authors, but also by their subjects, and many interesting and valuable results have been obtained. It was found that the threshold of audibility for speech could be deduced from the thresholds for pure tones, and that in general it is within 5 or 10 decibels of the patient's lowest reading for pure tones over the frequency range 250 to 4,000 cycles. The authors regard the pure-tone tests as a reliable index of the intelligibility of speech to the deaf listener. This would probably be challenged by workers who argue that speech is a complicated mixture of sounds, unlike simple tones, and that there is masking by one or more components of other components. They say that when masking effect is taken into account there is a considerable difference between the pure-tone curve and the curve embracing the masking effect. The authors found that stimulation by pure tones at large intensities caused variation in the threshold of minimum audibility. Instances occurred in normal subjects in which fatigue equivalent to a considerable degree of deafness, and sufficient to alter the quality of the human voice, persisted for several minutes, and in some cases hours.

After listening to sound continuously maintained for two minutes at 110 db. above the threshold of minimum audibility, normal subjects invariably showed a temporary diminution of auditory acuity over some part of the range of frequency involved in speech. The minimum intensities at which maintained pure tones excited auditory fatigue were found in general to be considerably less than those of the threshold of feeling. The magnitude of the fatigue was shown to be related to the duration of the stimulus. Possibly if the stimulation were sufficiently prolonged it would definitely injure the auditory organ. Whereas these effects were observed with pure-tone stimulation, loud speech of similar intensities produced no temporary loss in acuity whatever. The probable explanation of this, as the authors point out, lies primarily in the brief duration of the loudest components in speech sounds, which at most last half a second. Deaf subjects, on the other hand, were found not to be so susceptible to fatigue by pure-tone stimulation; the threshold for feeling is the same for both. The optimum intensity level of speech for normal listeners has been demonstrated by Bell Telephone Laboratories to be 70 db. In the case of the deaf the authors found it to be round about 110 db. or a little lower.

The authors, discussing different types of hearing aids, conclude that the best results are obtained with valve amplification instruments, and draw attention to the very marked limitations of the commercial bone-conduction aid—a timely warning in view of the sweeping claims made in the daily press for this type of instrument. They comment on the restricted usefulness of the non-valve battery aids of popular type, handicapped as they are by their low amplification, background noise, and undesirable character of their frequency response. There is, as they point out, even negative amplification at some frequencies in certain of the smaller aids. They have also investigated the intelligibility of speech tests, using telephones with different frequency responses.

Deaf Children

Particulars are given of 236 pupils in a school for the deaf. They are divided into three groups:

I: Totally deaf, no response to audiometer ...	43
II: Responded to only one or two frequencies of audiometer	44
III: Could respond to three frequencies or more	149

It was found that children belonging to Group II, although not totally deaf, could derive no appreciable benefit from the use of any aid. Groups I and II together comprise more than one-third of the total. This figure is very much higher than the comparable groups among the deaf children of London. Emphasis is laid on the importance of supplementing the use of hearing aids by lip-reading. A short account is given of the results of the use of hearing aids for class teaching, and the authors comment on the great advantage of this method over previous ones. They point out that reproduction of the highest quality is most important to the severely deaf child who is dumb or very retarded in speech when he comes to school. Attention is also drawn to the fact that a class amplifier yields better results than smaller individual aids employed by children at a distance from the teacher.

Conditions of Supply to the Public

From their experience the conditions under which hearing aids should be supplied to the public include:

(*a*) Tests of the patient's response to pure tones of the speech range.

[1] *The Use of Hearing Aids.* By A. W. G. Ewing, I. R. Ewing, and T. S. Littler. Med. Res. Counc. Spec. Rep. No. 219. H.M. Stationery Office. (9d.)

(*b*) A standardized articulation test of the patient's capacity to respond to amplified speech under controlled conditions.

(*c*) Articulation tests with the instrument which it is proposed to supply the patient for a period of trial.

(*d*) Familiarity on the part of those responsible for the supply of aids with the physical characteristics of each type of instrument, especially its frequency response and effective amplification.

To these might be added a clinical examination by an otologist.

Seven excellent tables are given which bear witness to the vast amount of careful work which is the subject of this investigation, and the results are a valuable contribution to knowledge.

KITCHENER SCHOOL OF MEDICINE, KHARTUM

The fifth report of the Kitchener School of Medicine, Khartum, covers the period 1933-5, and includes the reports of the assessors for these years, who were respectively Professor A. K. Henry and Dr. H. L. Tidy, Professor H. B. Day and Mr. Hugh Lett, and Sir Walter Langdon-Brown and Mr. C. H. Fagge. It is announced that the previous curriculum of four years followed by a compulsory year of post-graduate training in resident appointments has now been replaced by a course lasting five years. Comment is made that the students' knowledge of facts is very good, but that there is weakness in their ability to argue from them and to make the deduction which is a most essential part of the training of a medical practitioner. The proposed change in the curriculum would probably be of benefit in this connexion, especially if associated with the selection of students of the most promising type and the early weeding out of those who appear unsuitable. Entrants to the School of Medicine are selected from the fourth-year students of the scientific section of the Gordon College.

A graphic museum is being built and equipped at an approximate cost of £3,200; it will contain sections dealing with all diseases, and particularly with public health and quarantine problems of the Sudan. A pathological laboratory to accommodate ten students has been erected, and various pathological specimens have been sent to the museum from London. The number of hospital beds available for teaching purposes has increased from 270 in 1930 to 560 in 1935, and separate departments of ophthalmology, obstetrics, and gynaecology have been organized in addition to those already existing for medicine and surgery. All obstetrical work has been centralized under the Government obstetrical surgeon, comprising the midwives' training school, midwifery conducted in the district, and the Omdurman hospital for women, labour cases being carefully apportioned between medical students and midwife pupils. It is hoped that this scheme will go a long way towards solving the difficulty, always present in a Moslem country, of obtaining enough practical experience in midwifery for medical students. The first post-graduate course will probably be held in 1939, and the organization of this will be the only new development during the next few years.

Selected Sudanese medical officers are to be promoted to the rank of Sudanese medical inspector to undertake the duties of the present British medical inspectors. The cadre of British medical practitioners is only forty-three, and it will not be advisable in the public interest to reduce the number appreciably for many years to come, but it is expected that new posts created by future developments will be filled by suitable Sudanese officials. Three Sudanese sanitary officers have qualified, and are successfully holding posts previously filled by British sanitary inspectors, enabling the services of these latter to be used to greater advantage elsewhere, adequate direct supervision of the sanitary service now being established even in the more distant parts of the country. Sixty-six graduates of the Kitchener School will have replaced the entire cadre of Syrian medical officers by 1938, and the future output will be sufficient to replace wastage, relieve medical officers on post-graduate courses, and cater for future expansion.

Reports of Societies

ANAESTHETICS FOR NOSE AND THROAT OPERATIONS

A combined meeting of the Sections of Laryngology and Anaesthetics of the Royal Society of Medicine was held on February 5, with Mr. LIONEL COLLEDGE, president of the Laryngology Section, in the chair, for a discussion on the choice and technique of anaesthetics for nose and throat operations.

Mr. T. B. LAYTON said that there were three methods of approach to the subject: that all operations should be performed under a general anaesthetic unless there was something to prevent it; that all operations should be performed under a local anaesthetic, with a similar proviso; and an intermediate position. To the general principles of surgery there had to be added, for operations in this area, the principle of a guarded larynx. In bronchoscopic work the difficulty of maintaining a general anaesthetic in and out of the defile of the larynx made local anaesthesia the method of choice. He had seen major operations on the neck performed excellently under either general or local anaesthesia, but his own feeling was that, with the possible exception of block dissection of the glands of the neck, the future of surgery in this field, if it had a future, lay in local anaesthesia. With regard to premedication with local anaesthesia, morphine, preferably combined with scopolamine, was the best agent. It had the advantage that the patient could be roused by a firm voice, and when roused retained control. It was also an antidote to cocaine, and therefore, if anything, a factor of safety rather than of danger. With general anaesthesia the increased risk of premedication had to be weighed against any advantages that might be claimed for it. So far as he could see morphine offered the least risk, and it had the further advantage that it brought the patient into the operating theatre in a comfortable sleepy condition rather than the deep stertorous state produced by other drugs. After morphine it seemed to him that avertin was the least risky and the barbiturates the most. But the chief problem was why premedication was needed at all under local anaesthesia. It was needed to neutralize the unpleasantness of the manual manipulations during the performance of the operation. With general anaesthesia it was used merely to bring the patient into the theatre—that is, to neutralize fear.

Fear arose at two stages in operative surgery—namely, when the patient first decided to face operation, and again during the short period while unconsciousness was supervening. It was the surgeon's business to neutralize or prevent the latter fear arising. It was a criticism of the technique that it should be necessary to neutralize with a potent drug a fear that should never have been allowed to arise. A mental as well as an operative technique was necessary, and this should include the whole period from the time when the patient consented to operation to the time when he was made unconscious. It was due to nothing but suggestion if the fear became greater when unconsciousness resulted from something given by the mouth rather than by rectum. The aim should be to induce the patient to look upon the operating theatre as a place where he could find relief from pain, discomfort, or disease rather than as a chamber of horrors. If such a mental technique were available premedication would be unnecessary with general anaesthesia.

Basal Anaesthesia

Mr. H. E. G. BOYLE said that there were as many ways of anaesthetizing throat cases as there were surgeons and anaesthetists. He described the technique which he had evolved for himself after thirty-four years' continuous work in the throat department of St. Bartholomew's Hospital. The advent of basal anaesthesia had been of enormous advantage, especially in throat cases. The basal

anaesthetics he preferred were nembutal, avertin, and paraldehyde, and in that order. Having secured basal narcosis he gave gas-oxygen and ether, using only sufficient ether to enable him to pass a Magill nasal tube into the trachea. He mentioned the safety of gas-oxygen and the simplicity of the method, the value of a suction pump as an aid to both surgeon and anaesthetist, the use of the Davis gag, and the liability of blood to collect behind the soft palate and the prevention of this by means of a special tube.

Mr. W. S. THACKER NEVILLE said that for about ten years for all nasal operations he had used deep twilight sleep induced by morphine and scopolamine, with the local application of a paste of cocaine and adrenaline. With a few contraindications this proved satisfactory, as the anaesthesia gave him an almost bloodless field, and so allowed the operations to be performed completely and without haste. On the introduction of avertin he gave up the use of twilight sleep, and for major operations he adopted avertin with local anaesthesia, with or without intratracheal ether; for minor nasal operations he used evipan preceded by omnopon and scopolamine. For tonsillectomies he had used local anaesthesia with the patient in the recumbent position, but more generally he had used paraldehyde followed by ether. In children practically all operations were carried out with sodium soneryl as premedication, followed by ethyl chloride and ether. Painful dressings were performed under avertin alone, or under sodium soneryl followed by ethyl chloride, or under the momentary anaesthesia produced by a mixture of ethyl chloride and ether. Oesophagoscopies and bronchoscopies were carried out under avertin with cocaine paste applied to the pyriform fossae, with or without intratracheal ether.

Anaesthesia in Tonsillectomy

Dr. A. W. MATTHEW dealt with two methods of preventing foreign material entering the respiratory tract during anaesthesia for nose and throat operations—namely, by maintaining the defensive reflexes unimpaired, and by the use of an endotracheal tube and packing. In his opinion avertin, nembutal, and morphine should not be used with this technique because they tended to impair the defensive reflexes which it was most important to maintain. A small dose of evipan sodium could be given with safety. A great deal had been written on anaesthesia for tonsillectomy, especially with regard to the avoidance of psychological trauma in children. Sufficient stress was not laid on the fact that the average child was very sensible and full of confidence in his elders. If the anaesthetist was tactful, and gave the child a truthful explanation of what he was going to do the fear of the unknown would be replaced by tolerance of the known, and there would be no subsequent ill-will or lack of confidence. Betrayal of trust was the main factor in causing psychological trauma in the child. He favoured for premedication atropine, 1/100 grain, and nothing else. Chloroform, if well tolerated by the patient, was the anaesthetic of choice. With chloroform the depth of anaesthesia could be altered rapidly to meet the requirements of the surgeon. Post-operative vomiting was the exception.

Mr. D. F. A. NEILSON said that the question of the type of anaesthesia used for any operation must be considered primarily from the point of view of safety and speedy recovery, but other considerations unfortunately clouded the issue, such as expense and also the feeling of comfort, which the patient regarded as of supreme importance when faced with an operation. Skilled general anaesthesia meant the introduction of an extra specialist expert, or, in America, an anaesthetist nurse. Unskilled general anaesthesia could not be admitted as an argument against the use of general anaesthesia. He presented a few arguments in favour of general anaesthesia as compared with local for an operation such as tonsillectomy. These had to be considered apart from the personal feelings of the patient, but the patient's general reactions to local and to general anaesthesia were to be respected separately, and the economic consideration had also to be recognized. Intranasal operations could be advantageously carried out under combined local and general anaesthesia.

Dr. JOHN CHALLIS said that the addition of one single unnecessary drug, however innocuous to a patient, showed in itself a lack of skill, and should that drug be known to be dangerous, or to increase the period of normal convalescence, its use in normal cases was strongly to be deprecated. He was also against the routine use of basal narcosis, especially in operations in which a brisk return of the respiratory reflexes was to be desired. The use of scopolamine and morphine, in conjunction with gas-oxygen administered through an intratracheal tube, formed the ideal technique, being both safe and efficient. A special technique was required for major operations in the larynx. Two definite suggestions were put forward for discussion: (1) Had not the pendulum in favour of heavy premedication swung too far for the safety and well-being of the average patient? (2) Was not the administration of pure gas and oxygen rather a disadvantage than an advantage to the aural surgeon?

General Discussion

Dr. ZEBULON MENNELL said that from the anaesthetist's point of view the most important thing was to know his surgeon's technique. Just as there were many varieties of anaesthetic administration, so there were many surgical techniques. He deprecated the use of the sucker, having found it not infrequently keep up haemorrhage from the tonsillar bed. In certain cases, especially tonsils and adenoids in children, the psychological element was not considered sufficiently. Personally he thought it a dreadful thing to give a child an anaesthetic without premedication, and among premedicaments for children he thought nothing so safe as the old-fashioned paraldehyde. A mixture of chloroform and adrenaline was to be avoided; animal experiment had proved it to cause ventricular fibrillation.

Mr. SCOTT RIDOUT repeated the remark of Richard Gill that of all anaesthetics, to the one who knew how to give it, chloroform was the simplest. Dr. IVAN MAGILL mentioned certain precautions which should be taken when the Davis gag was used. Dr. HAROLD SINGTON said that a certain amount of restlessness followed paraldehyde if given too rapidly. He favoured large doses of atropine, 1/75 grain, in a child of 10, or even more in the winter when colds were prevalent. If atropine was used there was less likelihood of bronchopneumonia. Mr. SYDNEY SCOTT answered a decided negative to Dr. Challis's question whether the administration of pure gas and oxygen was not a disadvantage to an aural surgeon, though he agreed that it was a drawback that the patient after the operation came out very quickly, when it was preferable that he should remain drowsy for some time. Mr. HERBERT TILLEY said that in his experience one of the chief troubles with anaesthetics was not at the time of administration, but after return to the ward. Often the patient appeared to be suffocating, simply due to the fact that the chin was tucked into the chest, giving a kinked airway. Much was heard about the tendency with certain anaesthetics to post-operative haemorrhage. His plan was to tie the small artery in the upper recess of the tonsil at the time of operation, doing so in all cases whether there was bleeding or not. Dr. M. D. NOSWORTHY said that one of the reasons for premedication, apart from the psychological value, was that less anaesthetic was required. The patient recovered better from a small quantity of several drugs than from a very large dose of one. Personally he thought avertin preferable for premedication.

Mr. LAYTON, in reply, again spoke of the necessary mental technique. There had been retrogression in theatre, as distinct from operative, technique during recent years, owing, he believed, to war surgery, when cases came in great numbers to operation and the surgeon was working against time. Under civil conditions there could be no excuse for such pressure.

INJURIES OF PERIPHERAL NERVES

At a meeting of the Section of Surgery of the Royal Society of Medicine on February 3, Professor G. GREY TURNER presiding, the subject for discussion was injuries of the peripheral nerves.

Mr. HARRY PLATT, in introducing the subject, said that twenty years had elapsed since the great war was responsible for such a heyday of peripheral nerve surgery, and there had now arisen a generation of surgeons who had no share in that unique experience. In February, 1920, he explored forty-one injured nerve trunks and presented at the Royal College of Surgeons an analysis of pathological findings in 510 peripheral nerve operations over six and a half years. In the past six years he had done no more than eighty-nine such operations in civil practice, the nerves involved being: ulnar, fifty-five; median, fifteen; brachial plexus, nine; external popliteal, five; musculo-spiral, four; and anterior tibial, one. In thirty-nine cases the nerve injuries complicated fractures and dislocations, in thirty-two they were due to penetrating wounds, in nine there were traction injuries of the brachial plexus, and in nine there were other causes. Many nerve injuries in civil life, especially lesions associated with fractures, and most of the traction lesions of the brachial plexus in both infant and adult, did not reach the operating theatre.

The nerve lesions of civil practice were due to a variety of causes, and therefore presented a widely varying clinical problem. With regard to nerve lesions accompanying fractures and dislocations, in simple fractures peripheral nerve complications were uncommon. Not infrequently the signs of nerve involvement became fully established only during the early weeks following the injury, and in these circumstances the methods of treating the fracture which had been carried out might be open to criticism. In dislocations and fracture-dislocations of the shoulder-joint, except for circumflex palsy, nerve complications were rare. Circumflex palsy was seen in about 5 per cent. of all subcoracoid dislocations reduced promptly and efficiently in a large casualty clinic. The nerve lesion here was a traction injury produced at the time of the dislocation. In most cases with circumflex lesions relaxation and re-education brought recovery in three to four months. In infraclavicular plexus trunk involvement he had found that the nerve lesions almost invariably dated from the moment of the joint injury, and that when the nerve trunks had escaped initial damage the continued presence of the dislocated head in the axilla did not necessarily, or even commonly, set up a compression neuritis. The full effects of a severe infraplexus lesion were rarely demonstrable during the first week. On the whole the prognosis in primary lesions of the infraclavicular plexus trunks was not unfavourable; complete recovery within three to six months was the rule in posterior cord lesions. For inner cord lesions the recovery time was much longer.

Secondary Lesions

In the case of the true secondary lesions associated with an unreduced dislocation spontaneous recovery always tended to be inhibited because of the strangling effects of the extensive scar tissue which formed round the dislocated head. The nerve trunks should be freed without delay, either by means of open reduction or by excising the head of the humerus.

Musculo-spiral palsy could be seen either as a primary or as a secondary lesion. Primary lesions usually resulted from the direct impact of a bony fragment, and it could follow over-zealous efforts to manipulate the fractured portions into exact alignment. Secondary lesions here were due to adherence of the nerve trunk to a projecting fragment or irregular bony surface. In such surroundings the nerve trunk became gradually obliterated by dense cicatricial tissue. Most musculo-spiral lesions accompanying simple fractures were able to show spontaneous recovery; hence it was sound practice to employ conservative measures.

Nerve Injuries at the Elbow

Dealing next with nerve lesions in fractures and dislocations of the elbow, Mr. Platt said that the incidence of nerve complications in fractures of the elbow was very low. In this group the nerve lesions were almost exclusively in fractures of the lower end of the humerus or subluxation of the elbow-joint. The special vulnerability of the ulnar nerve in the post-condylar groove was well recognized. The lesions were usually incomplete, and under correct treatment the recovery was spontaneous. But in some there was a severe progressive neuritis, and for this a special neurolysis operation was needed, involving transposition of the nerve to the front of the elbow.

In twenty-two examples of epicondylar inclusion the ulnar nerve showed evidence of primary damage—that is, in all the cases. In seventeen of them the injured nerve was explored and transposed. Secondary lesions became evident three or four weeks after the date of injury and could be seen in both internal epicondylar and supracondylar fractures. The underlying cause was a disturbance of the normal relation between the nerve trunk and its bed. Owing to its more protected situation the median nerve was but rarely implicated in elbow-joint fractures, but the nerve trunk was occasionally impaled on the projecting lower end of the shaft in a supracondylar fracture with gross backward displacement of the lower fragment.

Turning to the lower limb, he said that in extensive ruptures of the ligamentous structures on the lateral aspect of the knee, produced by powerful adduction of the leg on the thigh, the external popliteal nerve might sustain most serious damage. In five of his cases a complete anatomical lesion with an extensive gap was discovered, and under great difficulty the operation of end-to-end suture was carried out. Often in such cases it was very difficult to find the distal end of the nerve trunk.

With regard to nerve injuries due to penetrating wounds in the upper limb these were seldom encountered above the level of the lower third of the forearm. In contaminated wounds in which infection had already secured a hold failure of regeneration after primary suture was almost inevitable. In such cases it was wise to postpone nerve repair until the wound condition improved. Referring to traction lesions of the brachial plexus Mr. Platt said that the lesions in this group presented two distinct problems: (1) the traction lesions of the infant during a difficult birth, and (2) those of the adult, usually caused by road accidents. Most cases in the first group showed spontaneous recovery of varying extent in the first few months. In the plexus lesions in the adult the degree of injury was much more severe.

Surgical Intervention

Sir ROBERT STANTON WOODS discussed the question as to the conditions in which surgical intervention was desirable in the case of these injuries. There were, first, general considerations such as age, the presence of complicating disease or injury, and the situation of the injury. In the second place, there was the nature of the injury, and here an accurate history was most important. Decision as to what to do might depend on which nerve was involved; the musculo-spiral was one of the most recuperable nerves in the body, as opposed to the ulnar. A further consideration was the degree of severity of the damage. Electrical examination was of no assistance in the days immediately following a supposed injury to a peripheral nerve. Electrical reactions gave indications merely of interference with the functions of excitability and conductivity.

He indicated three essential respects in which the results of electrical stimuli applied to muscles and nerves in conditions of injury or disease of lower motor neurons differed from those in normal health. No contraction was produced if the stimulus applied was a faradic one.

Further, the contraction process following the make or break of a direct current occupied an appreciable interval of time, perhaps a second or longer. This was succeeded by a still more prolonged period during which the contraction was very slow and deliberately subsiding. Sir Robert Stanton Woods entered in detail into the various kinds of electrical responses and their significance. He disagreed with the statement sometimes made that an electrical examination elicited few if any facts which were unobtainable by other neurological tests. There was, for example, the obvious fact that the only positive proof of the hysterical nature of a paralysis was the muscle response to electrical stimulus. Moreover, in a paralysed limb the organic and the functional could be accurately segregated. Muscle testing would also differentiate between muscles which failed to function owing to pain and those which were affected by a lower motor neuron lesion. Again, an accurate mapping out of responses might decide the level of the lesion; for example, it would help to distinguish between a paralysis of the circumflex nerve and one of the fifth root. He agreed with Lewis Jones that any deviation from the completely developed reaction of degeneration was important, and that a sluggish response to stimulus by the direct current was diagnostic of a lower motor neuron lesion, even in the presence of excitability by faradism. He added that no investigation of such a lesion was complete without an accurate account of skin and other sensibility, of voluntary muscular control, and electrical responses of all relevant muscles by all the means clinically practicable.

General Discussion

Mr. F. H. BENTLEY referred to experiments he had been carrying out at the Royal College of Surgeons in connexion with the surgery of nerve roots. The first point concerned the influence of scar formation at the anastomosis of a nerve suture. When a nerve was sutured union took place by scar formation, the scar filling the interstices and producing obstruction to the new-growing nerve fibres. The fibres were directed by the scar tissue rather than in a new organized pathway. In the cat, whenever approximation of the ends of the nerve at operation had not been accurate, the amount of scar tissue which formed was much increased. Even in a good scar there was considerable obstruction. Silk excited less tissue reaction than any other material for suturing. In man the only nerve grafting to be conducted with success was that of the facial nerve carried out after the method of Ballance.

Professor PATERSON ROSS said that in five cases of median nerve injury and twelve of ulnar nerve injury in his ten years' experience the effects following secondary suture had not seemed so severe as Sherren's work had led him to expect. There was, he thought, a tendency to attempt nerve repair in disadvantageous circumstances in early stages. Mr. COLTART asked whether the danger of late brachial plexus involvement was an indication for removal of the head of the bone in all cases. Mr. M. F. NICHOLLS agreed that these nerve repair operations should no longer be regarded as procedures which could safely be left to junior surgeons in a hospital. Some failures were more due to the persons operating than to the actual conditions that arose. The work called for great experience. Mr. REGINALD HOSFORD asked whether, in median or ulnar nerve palsy of the hand, it was advisable to try to prevent contractions by means of firm splinting.

The PRESIDENT (Professor Grey Turner) agreed that a number of delicate problems arose in connexion with nerve injuries sustained in fractures. The point mentioned by Mr. Nicholls was a very important one; some of these operations required as much skill and experience as did a gastrectomy. Mr. PLATT, in reply, said that he did not think contracture could be prevented by splinting; he left his patients entirely unsplinted. He thought instructions should be issued to most of the teaching hospitals on the lines mentioned by Mr. Nicholls. His reply to Mr. Coltart was in the negative.

ONCHOCERCIASIS AND BLINDNESS

The first Chadwick Lecture of the Royal Society of Tropical Medicine and Hygiene was held at Manson House on January 21, the president, Sir ARTHUR BAGSHAWE, being in the chair. Professor RICHARD P. STRONG of Harvard University gave an address on onchocerciasis in Central America and Africa, illustrating his lecture by cinema films and lantern slides taken during his expeditions to those regions.

In his introductory remarks Professor Strong pointed out that before 1932 there was nothing in the literature suggesting that ocular disturbances were connected with onchocercal nodules in African natives. On the other hand, in Central America onchocerciasis was sometimes termed the "blinding filarial disease"; hence the parasite which causes it was named *Onchocerca caecutiens*. Robles in 1915 had found ocular disturbances and blindness in Guatemala to be associated with nodules situated in the region of the head and scalp. After demonstrating microfilariae in lesions of the eyes in both Mexico and Guatemala, Hissette in 1932 drew attention to the frequency of onchocerciasis in the Belgian Congo and the high percentage of cases in which blindness resulted.

This decided the lecturer to organize an expedition to Africa with the object of studying onchocerciasis along the lines which he had already followed in Central America. Members of the expedition included an entomologist, a helminthologist, a zoologist, and an oculist. Headquarters were established in the village of Kassende in the Province of Lusambo in the Belgian Congo. The inhabitants of the region were mainly Bantus of the Basonga tribe, but in some sections Balubas and Babingis were encountered. Extensive infection of onchocerciasis was also observed among the forest pygmies. A special study of the eyesight was made in 156 cases with ocular disturbances and the tissues of the eye were studied histologically in forty. The association of ocular disturbances with this disease was demonstrated by the high percentage of failing vision and blindness in a locality where some 95 per cent. of the population were infected with the onchocerca parasite and had demonstrable nodules. Pruriginous and xerodermatous conditions of the skin were commoner than in Guatemala. Experience in both Africa and Guatemala indicated that patients with nodules or tumours on the head or shoulders were more likely to develop ocular complications than those with tumours elsewhere. Furthermore, microfilariae were discovered in greatest numbers in the skin in the vicinity of the tumours; very few were met with a considerable distance from the tumours. Bryant (1935) had recently made a study of Sudan blindness attributed to *Onchocerca volvulus*. The ophthalmic appearances were those of a diffuse retinochoroiditis with optic atrophy, often associated with sclerosis of the retinal vessels and the deposition of masses of pigment on the retina. The perivascular reaction so characteristic of onchocercal keratitis was not present. D'Hooghe (1935) had found that 2.1 per cent. of 3,448 native Africans presented ocular complications, but in most of them nodules were situated upon the trunk, the scalp being involved in only 5.7 per cent. The mere presence of microfilariae in the bulbar conjunctiva in small numbers, however, should not lead to the conclusion that the ocular disturbances were necessarily due to filarial infection: in tropical countries heat, wind, dust, and smoke within the house or hut were all important in producing such disturbances. Furthermore, avitaminosis, xerophthalmia, trypanosomiasis, and arsenical poisoning might also be responsible for blindness in regions where onchocerciasis prevailed.

Professor Strong emphasized that it was essentially through oecological studies that a knowledge of the disease and its control had been advanced, and made an interesting comparison between conditions in Central America and those in Africa. In both countries Simulium flies transmitted the disease. In Guatemala and Southern Mexico onchocerciasis existed only on the southern slopes

of the volcanic ridges at altitudes between 2,000 and 4,500 feet, and was especially connected with coffee production. Here 40 to 60 per cent. of the inhabitants were infected. The disease did not exist endemically in Guatemala and Mexico below 2,000 feet because the species of Simulium fly which transmitted the disease there did not breed below that altitude. In the Province of Lusambo in Africa, where onchocerciasis was prevalent, the terrain was characterized by ridges and hills separated by narrow valleys containing swiftly running streams where Simulium bred extensively. Here, however, the production of cotton and of mandioca and the collection of the piassava palm were factors predisposing to infection, and it was these agricultural pursuits which especially brought the inhabitants into contact with the fly vector. In Africa the black fly, *Simulium damnosum*, was particularly concerned in the transmission of the disease, and in Lusambo *Simulium dinelli* was also implicated. Both species of flies were frequently found breeding at altitudes below 1,000 feet, and in Liberia, Sierra Leone, and parts of the Belgian Congo onchocerciasis was prevalent at altitudes at or below 1,500 feet. Furthermore, in parts of Africa 33⅓ per cent. of wild flies were discovered to be infected, compared with a maximum of 5 per cent. in Guatemala. This accounted for the greater number of nodules found in Lusambo patients, where as many as 150 might be counted in one individual. In other places two to six appeared to be the number generally present.

Treatment consisted in surgical removal of the nodules or in destroying the parasites by the injection of drugs such as gentian violet or hexylresorcinol. In Guatemala there was evidence that treatment of infected individuals by destroying the focus of infection was a helpful prophylactic measure, but in Africa, where conditions were different, eradication of human infection would be entirely impracticable apart from the elimination of the fly vector.

Professor D. B. BLACKLOCK, who had first established the transmission of *Onchocerca volvulus* by *Simulium damnosum* in Africa, said he had not been able to find an association between eye lesions and *Onchocercus volvulus* infestation in Sierra Leone. He had found only one village in which the nodules were prevalent on the heads of the patients. Here sixty-six people were examined; thirty-three had nodules on different parts of the body, but in only eight of these were they present on the head. This village was overhung with enormous trees, and Professor Blacklock suggested that in South America frequency of nodules on the head might be associated with the overhead shade provided by the coffee planters, combined with the fact that people were better clothed. With regard to prevention, many suggestions had been made for eradicating the fly vector. Hissette had advised the clearing of the ground for 500 metres from habitations. Such a measure might be largely successful in localities such as Sierra Leone, where the fly hid in the tall grass and did not come out any long distance to attack.

"THE FRONTIERS OF PSYCHOTHERAPY"

At a meeting of the British Psychological Society (Medical Section) on January 27 Dr. H. CRICHTON-MILLER delivered his address from the chair in which, after some personal references, he discussed, with acknowledgements to the title of a recent book by Professor McDougall, "the frontiers of psychotherapy."

The first and in many ways the most obvious frontier was neurology, a frontier that had long called for a "commission of delimitation." Here Dr. Crichton-Miller took as an example the apache type of the post-encephalitic, a patient whose symptoms were a conduct-disorder, and therefore on the psychotherapist's side of the frontier. The aetiology, however, was an infection of the central nervous system, and as such was in the territory of the neurologist. The psychologist could provide a special and constricted environment for the patient; the neurologist could prescribe the appropriate dose of hyoscine or other palliative. In what quarter was to be sought any real hope of prevention if not of cure? Surely from the bacteriologist, who in collaboration with the clinician would one day be able to cut short an attack and ensure no degenerative sequelae. If the psychotherapist was obliged to recognize his curative limitations, it was useless for him to turn to the neurologist for help, as the neurologist could provide only diagnosis and medicinal palliation.

The neurologist and the pathologist were apt to extinguish aetiological speculation by saying: "There is not a shred of evidence to support — " this or that hypothesis, generally meaning that there were no post-mortem findings. Why should there be? They had all treated the morbid blusher; the blushing had a special and constant distribution, it was objectively verifiable, and yet no one would expect the phenomenon to be recognized post mortem. He conceived of the brain tissue as susceptible of transitory vicissitudes capable of modifying function without any permanent interference with structure. It looked as if psychotherapy, when it was not self-supporting, could not hope for much assistance from the neurological side of the border.

The Physiological Frontier

The physiological frontier was one where psychotherapists would often have difficulty in justifying their claim. Psychotherapy had been cursed almost since its inception by an easy assumption that functional nervous disorders were psychogenic in origin. It was a fallacy that what was functional had to be treated on psychological lines, and also a fallacy that because a condition was curable by psychotherapy, psychotherapy was the best cure for it. He had known cases of chronic constipation cured by Christian Science. He neither denied this fact nor did he recommend his constipated patients to become Christian Scientists. Similarly with anorexia nervosa, the subject of a recent article in the *British Medical Journal* (December 5, 1936), in which it was stated that early diagnosis depended on rapid exclusion of organic disease and recognition of the characteristic mental picture. He wondered which of them had ever seen, let alone recognized, a case of anorexia nervosa in which there was no constipation, menstrual inadequacy, or anaemia. He had no desire to keep anorexia nervosa on the psychological side of the frontier. He would retain his liberty of action, and when he found hypogonadism he would proceed to use those preparations now fortunately available which, used with reasonable intelligence, would rectify the amenorrhoea, at the same time applying such analytical skill as he could command to the elucidation of the inevitable Electra complex.

After discussing other borderline conditions, he deprecated the unwillingness of the psychotherapist to prescribe any of the preparations which the "lesser breed" of endocrinologists had found useful in such cases. Twenty-five years ago when he read his first paper in London his argument was, "Determine the major aetiological factor and treat it," and he found himself reverting to that theme. The sooner the frontier between endocrinology and psychotherapy was obliterated the better for their patients.

Sociology, Philosophy, and Religion

In considering the relation of practical psychotherapy to sociology it must be remembered that the bulk of their patients came to them because they were maladjusted to society. To-day society was looking to the psychologist for advice and to the psychotherapist for treatment. This frontier was one of great importance, as it lay at the root of human evolution. The problem might be formulated in some such terms as these: How far could mankind undergo further differentiation and yet endure the herd life that was necessarily based upon average contribution and standardized treatment? One contribution which psychopathology might usefully make was the correlation of delinquent trends with abnormalities of physical func-

tion—as, for instance, irresponsibility, aggressiveness, and suspicion, with such physiological data as blood-sugar ratio, basal metabolism, and blood pressure. It was easy enough to smile at some of Lombroso's too facile correlations, but it was more correlations that were wanted, not merely between a specific misdemeanour and a particular anthropometric anomaly, but between character traits and functional deviations.

Dr. Crichton-Miller also touched on some genetics problems and argued that psychotherapists ought to be able to tell the community something significant about marriage. "We psychotherapists stand, helpless and tongue-tied, while the optimistic parsons tie the knots at one end and the cynical old judges cut them at the other."

With regard to philosophy, he suggested that the usual training of a psychotherapist was unduly scientific, with not enough philosophy in it. It would "shake the otherwise enviable infallibility of the minor prophets of the Freudian hierarchy if they were to be put through a modified course of philosophy study. . . . They might revise the Freudian version of evolution." As for religion, he argued that it was a complete misrepresentation to suppose that the frontier line between religion and psychology was the same as that between the physical sciences and religion. The physical sciences had nothing to do with valuation. After discussing Freud's attitude to religion, Dr. Crichton-Miller earnestly contended that religion could not be shut out of psychotherapy. Some of those who came to them were in jeopardy because they were at the mercy of overwhelming instinctive forces, others because the limited logic of facts destroyed their self-confidence and veiled their vision. Taking up the aphorism of a witty Frenchman that "mankind will always prefer the false to the vague," Dr. Crichton-Miller bade psychotherapists beware lest when their patients came to them seeking something different from the vague they did not offer them the false instead. It was because he felt this so strongly that he rejoiced that Dr. T. A. Ross in his recent presidential address to the Psychiatry Section of the Royal Society of Medicine—a particularly opportune deliverance—ended it with the words: "Where there is no vision the people perish."

ASSOCIATION OF CLINICAL PATHOLOGISTS

ANNUAL MEETING

The tenth annual meeting of the Association of Clinical Pathologists was held at the British Post-Graduate Medical School on January 30. The new president of the society, Dr. S. C. DYKE, referred to the great loss sustained by the death of Professor E. H. Kettle. It was by his invitation that the meetings were being held at the Post-Graduate School, and it had been expected that he would preside. Professor Kettle's place as chairman of the meeting was taken by Dr. JANET VAUGHAN.

Laboratory Diagnosis of Gonorrhoea

The first half of the morning session was devoted to a discussion on the laboratory diagnosis of gonorrhoea.

Dr. GOODHART, in a communication on the diagnosis of gonococcal infection by films, said that there had been no important alteration in technique during the last twenty-five years: most people now used some modification of the original Gram method for staining, but for the particular purpose under consideration there was still a good deal to be said for the older technique as it avoided the danger of over-decolouring with alcohol. He had never departed from the admirable practice, insisted upon in his early days by Professor Eyre, of reporting only what he found, and never saying that gonococci were present when from the nature of the investigation a definite bacteriological diagnosis was manifestly impossible. Several workers had published figures to show the comparative value of smears and cultures in diagnosis. Conclusions differed, but they all seemed to confirm the view he had reached as the result of practical experience—namely, that everything depended on the material one was working with. Most of the statistics came from workers in venereal disease clinics or from research departments. In the former there was a reasonable presumption that the material sent for examination came from a patient who had been exposed to the chance of gonococcal infection, and in the latter optimal conditions for successful culture could be arranged. Much of the work of the ordinary practising clinical pathologist had to be done under very different conditions.

Dr. Goodhart's own views had undergone a complete change since he had been working in the hospitals of the London County Council, and he now regarded Gram-negative cocci other than gonococci to be such frequent inhabitants of the urogenital tract as to make the diagnosis by film alone highly dangerous, especially in vulvovaginitis in children. Most workers who had investigated cultural results carefully had found a number of "pseudogonococci," and the main purpose of his communication was to illustrate this point. He then described ten cases from which he had isolated Gram-negative cocci that from their cultural characteristics were clearly not gonococci according to prevailing views. In some of these cases smears had shown typical Gram-negative intracellular diplococci, in others not even pus cells were present. His experience suggested that it was often difficult to make an accurate diagnosis of gonococcal infection even by culture and that it was practically impossible by film alone.

Culture Methods

He was followed by Dr. JOHN OLIVER, who spoke on the diagnosis of gonorrhoea by culture. Two types of transparent culture media for the growth of gonococci were described. Hydrocele agar was considered ideal where it could be prepared without undue difficulty, or in substitution the egg-albumin medium of Price, which gave almost equally good results and was usually less difficult to prepare. The need for immediate inoculation of exudates was stressed and the desirability of incubation at temperatures lying between 35.5° C. and 36.5° C. without undue delay was also pointed out. The question of moisture in the culture tubes was dealt with and desiccation described as the most important factor in the death of gonococci in swabs.

The influence of the atmosphere in which culture takes place was considered, and it was pointed out that a replacement of some 8 or 10 per cent. of atmosphere by CO_2 gave some distinct advantage for successful culture of gonococci. The oxidase reaction as a means of diagnosing the presence of gonococci in mixed cultures was explained, and finally the fermentation reactions of the organism were discussed very briefly.

The discussion or diagnosis of gonorrhoea by the complement-fixation test was to have been opened by Dr. ORPWOOD PRICE, but owing to his absence on account of illness this subject was introduced by Dr. C. DUKES, who gave a brief account of Price's method of performing the test and discussed the general significance of the reaction.

Complement-fixation Test

Dr. Dukes said that it was important to bear in mind in the first place that this serum reaction did not show the presence or absence of gonococci in the tissues; it only registered the presence or absence of gonococcal antibodies in the blood. The amount of such antibody might be expected to vary with the amount of toxin absorbed. It was obvious that if the gonococcal lesion was "open," with plenty of opportunity for free drainage, there would be comparatively little opportunity for toxic absorption. This state of affairs existed in simple gonococcal urethritis, and explained why the complement-fixation test remained negative for the first week or two of the disease. If the disease spread to the seminal vesicles the toxic products were unable to drain efficiently

and the condition of a closed infection arose, so that antibody production increased rapidly. This being so a positive gonococcal complement-fixation test might be taken as evidence of present or immediately previous gonococcal infection, but a negative test did not exclude the possibility of gonorrhoea.

The possibility of cross-fixation with antibodies of allied bacteria such as *Micrococcus catarrhalis*, the meningococcus, and *Micrococcus flavus* had often been raised, and the evidence on this question had not been altogether conclusive. Dr. Orpwood Price had carried out a series of experiments in which he prepared antisera against the gonococcus, *Micrococcus catarrhalis*, and *Micrococcus flavus* by injecting rabbits with these bacteria. The sera were then tested against gonococcal antigen in serial dilutions ranging from 1 in 10 to 1 in 80 as for a complement-fixation test. These experiments showed that a weak degree of cross-fixation with the antibodies of *Micrococcus catarrhalis* was liable to occur.

Test of Cure

Dr. Dukes referred also to Dr. Price's views on the gonococcal complement-fixation reaction as a test of cure. As long as a patient had a persistently positive complement-fixation test he should be regarded as infective and remain under medical supervision. When the test became negative after having previously been positive this in itself must not be taken as evidence of cure. In any test of cure both clinical and pathological examinations must be considered, and it was suggested by Price that if the patient showed no clinical signs or pathological evidence of the disease, normal life, with the single exception of coitus, should be allowed for one month. Then the patient should be re-examined and all tests repeated. If these still yielded negative results a further month of normal life should be allowed before the final tests were made. When these were satisfactory the patient might be regarded as cured. The gonococcal complement-fixation test could not be regarded as a substitute for other methods of deciding when a case was cured. Its evidence should always be supported by the results of smears and cultures.

Diagnosis of Syphilis

The second half of the morning session was devoted to a discussion on the diagnosis of syphilis, introduced in the first place by Dr. J. G. GREENFIELD with a paper on the cerebro-spinal fluid in neurosyphilis. He pointed out that the four reactions proposed by Nonne in 1909 still remain the most important for the examination of the cerebro-spinal fluid in syphilis. These four reactions are: the cell count, globulin estimation, Wassermann reaction in blood and cerebro-spinal fluid, and a colloidal reaction. Dr. Greenfield discussed these in turn and then took up the question of the cerebro-spinal fluid at various stages of syphilis and its relation to treatment. In the secondary stages of syphilis meningeal reactions may occur in a small proportion of cases, but since the majority are not followed by neurosyphilis it seemed unnecessary to perform lumbar puncture on patients before or during treatment unless there were clinical signs of syphilitic meningitis, in which case lumbar or cisternal puncture was a curative measure.

Only those cases in which meningeal reactions persisted into the latent period appeared likely to develop neurosyphilis, and therefore the best time to examine the cerebro-spinal fluid in the earlier stages was a year after a complete course of treatment or at the end of the third year after infection. More frequent punctures during the secondary stage were not contraindicated, but the appearance and disappearance of meningeal reactions should not be allowed to influence treatment.

In the later stages a certain diagnostic and prognostic value attached to the rapidity with which the Wassermann reaction in the fluid cleared up under treatment and to variations in the Lange reaction. Although it was generally true that in meningo-vascular forms of neurosyphilis the Wassermann reaction in the fluid cleared up rapidly under treatment, there were many chronic cases of meningeal syphilis in which this rule did not hold good. In tabes and general paralysis the Wassermann reaction in the fluid was very stable and usually only weakened along with the weakening of the Wassermann reaction in the blood. But after malarial treatment in favourable cases the Wassermann reaction in the fluid might clear up fairly rapidly, while the blood Wassermann reaction remained strong. In the latter type of case examination of the fluid at intervals was of definite prognostic value, and enabled relapses to be detected and treated at an early stage. Variations in the Lange reaction were also of value in prognosis, weakening of the reaction in a general paralytic after treatment with malaria or tryparsamide being usually of good omen, while a progressive strengthening of the reaction in cases of tabes or old-standing syphilis pointed to the onset of general paralysis.

Dr. H. C. LUCEY read a short paper entitled "Wassermann Snags," in which he gave his experience of certain practical difficulties in the performance of this test and ways in which they might be overcome.

Congenital Syphilis

Dr. A. G. SIGNY, opening a discussion on congenital syphilis, said that in view of the general difficulties met he would describe various methods available for collection of reasonable specimens of blood from children. He described the puncture of the anterior fontanelle, the external jugular vein, and the internal jugular vein. He then stressed the importance, in testing the blood of children, of doing at least two types of tests—a recognized complement-fixation as well as a recognized precipitation test. He then discussed in detail the interpretation of the results of these tests, particularly the anomalous results which are occasionally met with. He emphasized the necessity of a repeated test before a diagnosis of syphilis is made from serological evidence alone, especially in young infants who are quickly made negative on treatment. The value of a provocative injection of arsenic was pointed out in doubtful or weak positive reactions. The histology of congenital syphilis was briefly described and said to be characteristic in many organs, especially the liver. He then discussed the anaemias of congenital syphilis and described how readily the children improve as the syphilis clears up under specific therapy.

Dr. DAVID NABARRO stated that investigations carried out at Great Ormond Street showed more than half of the congenital syphilitic infants seen to have positive findings on examination of their cerebro-spinal fluids. As a rule this condition responded readily to the recognized treatment by injections, and in his experience the fluid which had once become negative very rarely altered. In the majority of these cases the neurosyphilis was latent, but sometimes there were signs or symptoms such as hydrocephalus, convulsions, and possibly mental retardation. In his opinion a lumbar puncture should be carried out in every case of congenital syphilis in order to detect latent neurosyphilis, especially in rather older children, and to treat it so as to prevent such untoward events as hemiplegias, meningo-vascular lesions leading to mental degeneration, and so on. In his experience the treatment of neurosyphilis with clinical manifestations in children was most disappointing, and on that account he strongly urged the routine lumbar puncture of all congenital syphilitics.

In reply to a question from Dr. GOODHART as to whether he had seen the symptoms in pregnant mothers diminish in intensity, Dr. NABARRO stated that in his experience the majority of syphilitic mothers showed no signs or symptoms of the disease with the exception of a positive reaction in the blood. It was stated that the blood reaction became negative during pregnancy, and this was adduced as a reason for not doing routine blood tests on expectant mothers, and particularly those who attended ante-natal clinics. In Dr. Nabarro's experience the

Wassermann remained positive in pregnancy and often quite strongly positive, though in some cases it did diminish in intensity, which was doubtless due to the treatment the mothers were having. During the last few months he had two infants brought to the clinic at Great Ormond Street, both of them syphilitic, yet the mothers had both attended ante-natal clinics during pregnancy, but had not had a test taken, and therefore had received no antisyphilitic treatment. In his opinion every mother who was expecting to have a child should have a blood test.

Demonstrations

In the afternoon the following demonstrations were given: Dr. E. J. KING demonstrated the microchemical methods applied to capillary blood for the estimation of sugar, urea, uric acid, creatinine, and chloride. Dr. JOHN GRAY illustrated by museum specimens and histological slides the main types of Bright's disease. Dr. JANET VAUGHAN demonstrated material obtained from sternal marrow puncture in the following cases: (1) normal marrow; (2) case of Addisonian pernicious anaemia; (3) two cases of myelomatosis; (4) case of secondary carcinomatosis. In the three latter cases the biopsy had enabled a correct diagnosis to be made. She also described the technique employed and the instruments used.

Dr. A. A. MILES and Dr. J. GRAY demonstrated the post-mortem and bacteriological findings in two cases of endocarditis due to infection with organisms provisionally identified as *Haemophilus influenzae*. The main interest lay in the organisms isolated, which corresponded closely with strains isolated in the last few years from similar cases. The following were demonstrated: the cultural and biochemical characters of the organisms; a rapid bacteriological test for a preliminary differentiation of these organisms from true *influenzae* organisms; and an important fallacy in the preparation of yeast extract, peptone water, and "sugars."

LEFT ILIAC PAIN IN WOMEN

A meeting of the Midland Gynaecological and Obstetrical Society was held in Birmingham on December 1, 1936, under the chairmanship of the president, Mr. A. B. DANBY, when Dr. D. A. MITCHELL (Bath) read a paper on "Left Iliac Fossa Pain in Women."

Dr. Mitchell drew attention to the fact that iliac fossa pain was commoner on the left side than on the right, and was most often due to gynaecological conditions. In many cases there was retroversion. Movement of the body of the uterus to the right reproduced the iliac pain by putting the broad ligament on the stretch. Operative findings were retroversion of the uterus, often with subinvolution; there was prolapse of the ovaries with adhesions, and varicocele of the left ovarian veins was present. There was also thickening of the mesentery of the pelvic colon at the point where the peritoneum of the left broad ligament was reflected at the brim of the pelvis on to the colon. There was contraction at the outer end of the left broad ligament, causing the pelvic colon to lie over the fimbriated end of the tube and over the left ovary. Dr. Mitchell held that Lane's "first and last kink" was in many cases secondary to the condition of the broad ligament. Treatment should therefore be directed to curing the gynaecological condition rather than to interfering with the mesentery and peritoneal bands and folds, which constituted a protective mechanism. In addition, the varicocele was a frequent cause of pain, and the importance of dealing with this lesion was emphasized. The prevention of these conditions was next discussed, and stress was laid on the importance of post-natal exercise of the muscles of the pelvic floor and on the prevention of subinvolution by the method of pre-natal quininization.

Mr. LOCHRANE (Derby) referred to the importance of remembering the possibility of there being an element of neurosis in cases of left iliac fossa pain, but agreed that in some the cause of the pain was mechanical. He had occasionally produced permanent relief by the division of ligaments and bands. Mr. MASLEN JONES (Wolverhampton) said that he had found the use of a pessary very useful in the decision as to the importance of the retroversion as a cause of pain. He wondered if it was justifiable to open the abdomen in doubtful cases of varicocele.

MODERN TREATMENT OF FEVERS

At a meeting of the London Association of the Medical Women's Federation on January 26 Dr. ANDREW TOPPING spoke on the modern treatment of fevers.

Scarlet fever, he said, the commonest of the acute exanthemata, presented great difficulties to the administrator. In the early days of fever hospitals many had hoped that its incidence would be reduced. The mortality had been lessened, and for the past thirty years the illness had been extremely mild, so that the question now arose whether the patients should be treated in hospital. Scarlet fever was one manifestation of streptococcal infection; probably many of the twenty-eight recognized kinds of streptococci might cause it in some cases and give rise to streptococcal throat infection in others; isolation of the scarlet fever patient could not prevent others from occurring, and some patients undoubtedly became infected with other strains while in hospital. The one big innovation in treatment was the use of antitoxin. Nowadays every serious case received it, and in some fever hospitals every patient did so; the illness was cut short by it, desquamation did not occur, and there were fewer sequels. Prontosil, first used in Japan and then in Germany, was the one drug now available which showed promise of being effective against several kinds of streptococci. Dr. Topping thought that convalescent serum had no curative value in measles. Intensive treatment by dosage with vitamins A and D had been carefully tried by Dr. Helen Mackay, who had reluctantly come to the conclusion that it made no difference. Eye and ear consultants should be called in early to eye and ear cases before the conditions were firmly established. The London County Council was establishing country convalescent homes for these patients so that they might lead more normal lives. Whooping-cough cases seemed to be free from ear complications, and it was thought that if the children laughed, ran about, and coughed the pharynx was kept clearer and the ears recovered more quickly. Oxygen had proved very useful for pneumonia; the London County Council had twenty tents in use, and planned to have twice as many before the next epidemic, expected to start in November. Patients with whooping-cough should be granted admission to hospital much more readily than they were. The difficulty there was to convince parents and local councillors that children were not infectious for more than a fortnight after developing the whoop. Treatment had been attempted with cow serum. Luminal sodium was probably the best drug, but its dose had to be adjusted with great care according to the weight. Drowsiness had to be avoided. Direct plates revealed the bacillus a month or six weeks after the whoop had appeared, but that was not evidence of infectivity; probably a virus was either necessary for the invasion by the bacillus or was the causal agent itself. Diphtheria could be stamped out by an efficient immunizing campaign. The principal causes of failure in its treatment were failure to recognize the condition, reluctance to admit the diagnosis, and reliance on swabs. It was axiomatic that the death rate varied with the length of time between the onset of the illness and the giving of a sufficient dose of antitoxin. The size of the first dose was of great importance; the work done on the subject all over the world had shown that the toxin, once fixed in the tissues, was impervious to antitoxin. The gravity of each case had first to be assessed; whether it was the first, second, or third day of infection, and whether there was marked toxaemia. Sixteen thousand units were

enough for mild cases, but where there was smell, bull-neck, or the likelihood of marked toxaemia 60,000 to 100,000 units should be given intravenously immediately. A booklet issued by the London County Council (price 3d.) gave full details of the technique of giving the dose. Intubation had supplanted tracheotomy in most instances. The Drinker respirator, although a cumbersome apparatus, was giving almost uniformly good results in the treatment of diaphragmatic paralysis. Cerebro-spinal fever was now diagnosed more satisfactorily by blood culture than by examination of the cerebro-spinal fluid; by the latter method a mild or fulminating case might be missed, while blood culture gave a positive result in almost every case. The modern treatment was the insertion of a special lumbar puncture needle, and leaving it there to allow a continuous drip. Antitoxin was injected into the blood stream. The speaker mentioned that in America vaccination was now being carried out by intradermal injection with good results. He thought that there was no evidence that the present mild form of small-pox would breed true. He had seen one confluent case in which the only apparent contact had been an ordinary mild one.

Prophylactic Aspects of Fevers

Dr. E. ASHWORTH UNDERWOOD, speaking on prophylaxis, said that attempts at producing immunity had been made many centuries ago, when physicians exposed their patients to diseases in the hope that they would catch a mild form of them. Jenner's inquiries represented the first scientific step towards specific prophylaxis. Of the five principal diseases against which artificial immunity was being tried here diphtheria was so far the most favourable. At the time when the Medical Research Council published a monograph on it in 1923 many people had felt confident that the use of antitoxin could keep the mortality down to the low figure of about 4 per cent. Then reports from Berlin and Budapest of more frequent severe cases caused disquiet, and about five years ago such cases became common in this country. The Schick test gave the most reliable indication of individual immunity. The full dose had to enter the arm, being preferably injected into the skin, but the speaker was not convinced that if some of the fluid passed into the subcutaneous tissues the result was altered. Pseudo-reactions were not so common as they had been seven years ago. They were commonly held to be detectable on the fourth day, but he thought that the test should be repeated when doubtful. The Moloney test consisted of observing the reaction produced to the intradermal injection of dilute toxoid; the reactions resembled those of the Schick test. A positive result denoted sensitization of the individual by the products of the diphtheria bacillus, and had been obtained in 80 per cent. of his cases which reacted strongly to toxoid treatment. The first method of immunization used was injection of toxin fully neutralized with antitoxin, but the danger of freezing or faulty mixing setting free unneutralized toxin caused the method to be given up. It was succeeded by toxoid-antitoxin mixture (T.A.M.), which the speaker thought should now go into honourable retirement. Among its successors were formol toxoid, alum toxoid (formol toxoid precipitated by alum and acting over a long period because of its insolubility), and toxoid-antitoxin floccules (T.A.F.). The first two were apt to cause reactions, but acted relatively quickly; the third was undoubtedly the simplest and most innocuous prophylactic known, although somewhat slow. The relative advantages of one- and multiple-shot methods had been much discussed; if the resulting immunity was compared two or three shots would always win. The speaker showed by graphs how incidence and death rate fell with a rising proportion of the population immunized. He considered that at least 30 per cent. of pre-school children should be treated to keep the disease in check. Immunity to scarlet fever was not so satisfactory. Five doses were necessary, and then apparently only protected against erythema and not against invasion; the patient might still go about with a streptococcal infection of the throat. Two types of serum were in use for protection against measles: the convalescent type obtained from patients between the seventh and tenth days of illness, and the adult serum from healthy people who had had measles. Protection could be conferred for a few weeks by either type if given within six days of exposure; attenuation could be achieved by a full dose given later or by a half dose within the six days. The modified attack conferred immunity for life.

In reply to a question from Dr. D. MCNAIR about a Schick reaction appearing on the sixth day, Dr. UNDERWOOD said that a delayed reaction was recognized. Dr. G. M. SANDES asked about the use of placental extract in the treatment of measles, to which Dr. UNDERWOOD answered that he thought it had not been a great success. In reply to Dr. A. F. JUDD he said that measles serum was procurable from Messrs. Burroughs Wellcome; it had to be stored on ice. In practice 10 c.cm. of parental blood injected into the child's buttock would prevent or attenuate the illness. Dr. URSULA BLACKWELL mentioned that her experience at a fever hospital confirmed what Dr. Underwood had said.

Local News

IRELAND

Medical Research Scheme for the Free State

Mr. Phillip O'Reilly, solicitor, on January 26 obtained the certificate of incorporation of the Medical Research Council of Saorstat Eireann. The subscribers to the Memorandum and Articles of Association are Dr. J. W. Bigger, professor of bacteriology, Trinity College, Dublin; Dr. John McGrath, Dublin; Dr. Henry Moore, professor of medicine, University College, Dublin; Dr. W. J. E. Jessop, professor of physiology, Royal College of Surgeons, Dublin; Dr. James M. O'Connor, professor of physiology, University College, Dublin; Dr. T. Gillman Moorhead, regius professor of physic, Dublin University; Dr. J. F. Donegan, professor of physiology, University College, Galway; and Dr. J. M. O'Donovan, professor of medicine, University College, Cork. An important step has thus been taken in bringing to fruition the scheme for the development of medical research in Ireland, which has occupied the attention of the medical profession for many years. In 1933 the Academy of Medicine submitted to the Minister of Local Government and to the Committee of Reference for the Sweepstakes a scheme for medical research. This scheme, which was very comprehensive, was intended to include pure scientific research as well as clinical research and also the provision of scholarships for research workers in other countries. It was considered that it would involve a capital expenditure of a million pounds. It was felt, however, under all the circumstances, that the Hospitals Commission could not recommend its adoption while the claims for the Irish hospitals were as pressing as they were then. Meanwhile the Associated Hospitals Committee had been independently considering the possibilities of promoting a medical research scheme, and had appointed a subcommittee in this matter. The two bodies combined and formed a joint committee, which was augmented by the inclusion of representatives of Dublin University and the three constituent colleges of the National University. The amalgamated body subsequently presented a revised scheme to the Minister for Local Government and Public Health. In this scheme the idea of a central research institute was abandoned, it being felt that the capital expenditure involved was scarcely justifiable at this stage. The scheme, however, was said to combine the claims made on behalf of clinical research in hospitals and purely scientific research in medical colleges. It was

ultimately agreed between the Hospitals Commission and the Joint Committee that for the present a sum of not less than £10,000 per annum should be set aside for the purposes of this scheme. Of this sum £4,000 is required to enable scholarships to be awarded to suitable candidates in other countries. The advantages of such external scholarships are many. Among the principal would be the opportunities of establishing contact for Irish schools of medicine and research workers with like workers in other countries, and the spreading of the benefits of Irish medical science throughout the world. The Articles of Association provide that the members of the council shall be nominated as follows: one, the chairman, by the Minister for Local Government and Public Health, and one each by the National University of Ireland, the University of Dublin, University College, Dublin, University College, Cork, University College, Galway, the Royal College of Surgeons in Ireland, the Royal College of Physicians of Ireland, and the Royal Academy of Medicine in Ireland.

A Hospital Year Book and Medical Directory

The first issue has now been published of a new venture, *The Irish Free State Hospital Year Book and Medical Directory*.[1] It is a volume of well over 200 pages, each about the size of a page of the *British Medical Journal*. There are three main sections: a series of signed articles, nine in number, by well-known Dublin medical men; a detailed account of the hospital position in the Irish Free State; and a directory of medical practitioners, to which is appended a dispensary list. The hospital section is set out under counties, the classification following that used in the first general report of the Hospitals Commission; and particulars of some 200 hospitals, large nursing homes, and sanatoria are given. The medical directory contains the names and professional particulars of about 1,400 medical practitioners in the Saorstat; it does not include doctors retired or holding temporary appointments in hospitals. In an editorial foreword high tribute is paid to Dr. J. P. Shanley, honorary secretary of the Irish Free State Medical Union (I.M.A. and B.M.A.), "whose constant advice and practical help have been responsible to a great extent for the successful compilation of this edition." One of the special articles —on the Irish Free State Medical Union—is from Dr. Shanley's pen. A few introductory pages give particulars about the principal medical and allied bodies in the Irish Free State. This should prove a very useful reference book.

The Queen's University, Belfast

The recent appointment of Professor John S. Young to the chair of pathology in the University of Aberdeen is a further recognition of his position in the world of pathology. His colleagues in Belfast have congratulated him most heartily, but at the same time genuinely regret his departure in a few months' time. Professor A. M. Drennan held the Musgrave chair in Belfast from 1928 until 1932, when he was appointed to the University of Edinburgh. Professor Young succeeded him in 1932 and was immediately faced with the organization of the work in the new Institute of Pathology which had been built in the grounds of the Royal Victoria Hospital. This was in itself no light undertaking, but Professor Young threw himself into his duties so ardently and so successfully that the routine work of the department is a model which is the envy of those who have inspected its organization. The standard of teaching in pathology which Professor Young has established has never been higher than in Belfast at present, and it will demand a distinct personality in his successor if it is to be maintained. Professor and Mrs. Young have been very popular in the Belfast Medical School, and their friends wish them every happiness and success in their new circle.

[1] O'Neill Publications Ltd., 11, Dawson Street, Dublin. (10s. 6d.)

Dr. Leonard Kidd

The decision of Dr. Leonard Kidd to retire from active practice was received with universal regret in the Enniskillen and Fermanagh district. He has been an outstanding figure in medical circles in Ireland for many years and has taken a prominent interest in medico-political affairs all his life. He has been medical officer to the Fermanagh County Hospital for over forty years and has carried on his work there with marked ability and conspicuous enthusiasm. He is a member of the General Medical Council and a past president of the Irish Medical Association (now merged with the B.M.A. as the Irish Free State Medical Union). Some years ago he was a very acceptable president of the Ulster Branch of the B.M.A. In the recent honours list it was intimated that the Governor of Northern Ireland had approved Dr. Kidd's appointment as Deputy Lieutenant for County Fermanagh, an honour which he has well deserved and which his colleagues in Ireland hope he will long enjoy in his retirement.

ENGLAND AND WALES

Rebuilding of Bath Hospital for Rheumatic Diseases

At a meeting at Vintners' Hall in the City of London on January 27 an appeal for funds was made for the rebuilding of the Royal National Hospital for Rheumatic Diseases in Bath. Sir Edward Grigg, M.P., who took the chair, reminded the meeting that the hospital was founded under a different name two hundred years ago by Beau Nash. It was intended for poor people, who only by free treatment and maintenance could benefit from the waters of the hot springs. Nearly 120,000 patients had entered the institution, and of these it was claimed that over 100,000 had been cured or materially benefited. The city council had now offered a site nearer the hot springs and four times the extent of the old. This would make it possible to build a modern hospital with greatly extended baths and laboratories for research. Accommodation would eventually be provided for 250 patients, and the cost would be £200,000. He emphasized the fact that this was not merely a local hospital making a wider appeal; no fewer than 98 per cent. of its patients came from places outside the locality, one-third of them from South Wales and one-quarter from London, and the remainder from various parts of Great Britain. In the absence of Lord Horder, who was prevented from attending by indisposition, Sir William Willcox spoke in reinforcement of the appeal. He said that the undertaking was worthy of enthusiastic support on a national scale. He deprecated the present tendency to employ complicated drugs in dealing with rheumatic complaints. The use of such drugs was attended in many cases by greater danger to life than the disease itself entailed. The advantage of the hospital lay in its access to a natural remedy, which was beneficial and had no injurious or dangerous properties. It also afforded a field for research into rheumatic disease. A disease might come to be so commonly accepted as part of the life of the community that no one asked why it should continue. That had been the case more or less with tuberculosis; it was only thirty-five years ago that a national campaign against the disease was organized. There was no reason why rheumatic diseases, as a result of well-considered research, should not be stamped out.

Scheme for Cancer Treatment in Wessex

A scheme for the co-ordination of the treatment of cancer over a large area of southern England was proposed at a preliminary meeting held at the Southampton Civic Centre on February 9, under the presidency of Lord Malmesbury. In a memorandum outlining the scheme Dr. A. G. C. Taylor of the Regional Radium

Centre at the Royal South Hants and Southampton Hospital states that annually in Wessex (which for this purpose is taken to include Hampshire, Dorset, Isle of Wight, East Wiltshire, and West Sussex), with a population of one and three-quarter millions, 2,000 cases of cancer, with 300 other cases of non-malignant conditions, would benefit by radiation treatment, but that at present only about 600 cases a year receive such treatment. Even the insufficient resources of radiation in the area are not organized to the best advantage. His scheme is, in brief, that all the resources of the general hospitals should be pooled and placed under the control of a representative co-ordinating committee. Tumour clinics should be established in the larger towns (Chichester, Ryde, Winchester, Southampton, Bournemouth, Salisbury, Dorchester, and Poole), at which new cases would be seen and treatment planned in consultation with a radiotherapist, old cases would be followed up, and operative measures carried out. Major radiological treatments would be given at radiotherapeutic centres in connexion with the tumour clinics at three towns (Portsmouth, Southampton, and Bournemouth). Such an organization, he points out, would make available to patients in outlying districts the advice of a radiotherapist at not too great a distance; it would enable local surgeons to retain an interest in their cases, and, while providing the centralization necessary for major radiological treatments, it would relieve the congestion of beds in the larger towns. The central co-ordinating committee, on which all the tumour clinics would be represented, and of which all the medical officers of health of the area would be members, would control the radiotherapeutic resources, including both radium and deep *x* rays, through a radiotherapist and his assistants, who would be responsible to the committee. It would co-ordinate treatment and raise and distribute funds. It would acquire radium and apparatus and place them most advantageously, and it would also prevent any undue financial burden falling on a particular clinic. The organization is suggested by the successful radiotherapeutic centre at Manchester and the tumour clinics at Wolverhampton, as well as by American experience. The aim is so to organize the treatment that the purely surgical treatment of cancer as well as surgical measures preceding or following irradiation will be carried out locally so far as possible, while the major radiological treatment will be given at the three principal centres.

Empire Conference on Tuberculosis

As already announced in these columns (January 30, p. 241) an Empire conference on care and after-care of tuberculosis is to be held in London from May 3 to 8. Lord Willingdon, who is to be president of the conference, explained its objects at a recent gathering at Over-seas House, St. James's, where the sessions are to be held. He said that at the time of the Coronation, when a large number of oversea visitors would be in London, it was desired to bring together those who were interested in this subject. The warm approval of many Ministers of the Crown and the heads of Empire Governments had been secured, as well as that of distinguished members of the medical profession. Sir Pendrill Varrier-Jones, medical director of Papworth Village Settlement (which, with the Over-seas League, is arranging the conference), pointed out that while tuberculosis was declining in Great Britain this was not the case in various parts of the Empire. Their oversea visitors would have very useful information to impart on the impact of tuberculosis on peoples who had not acquired natural resistance. The experience of Great Britain in dealing with tuberculosis problems would also be of use to the Dominions and Colonies. He reminded the meeting of the special responsibility of Great Britain towards Empire peoples in regard to diseases which followed upon the invasion of the white man in other parts of the world. Professor S. Lyle Cummins said that the conference would enable representatives of oversea communities of European stock to study at first hand sanatorium and other developments in this country. The oversea visitors would not only come to learn but also to impart the many new ideas that they themselves were developing in their own territories. In the aboriginal races, still forming the vast majority of the population in many colonies and protectorates, the tuberculosis problem was presented in a very acute form. In their primitive conditions these people had enjoyed relative freedom from endemic tuberculosis, but those conditions were altering to-day. The European had introduced two elements into the older cultures he had invaded: the germs of disease which he himself had come to tolerate but which might be fatal on virgin soil, and the industrial conditions to which he was accustomed, but which were foreign to those amongst whom his work was placed. The forthcoming conference was an essential step towards discussing and perhaps comprehending better the intricate problem of the prevention and cure of tuberculosis in the native populations.

Inspectors of Midwives

The Minister of Health has asked for the observations of the London County Council on the draft Midwives (Qualifications of Supervisors) Regulations, proposed to be made under the Midwives Act, 1936. The Council in appointing inspectors of midwives has always required them to be registered medical practitioners with a high standard of obstetric experience, but none of the four inspectors engaged by the Council has a diploma in sanitary science, public health, or state medicine, as suggested in the draft regulations. It is pointed out that the Minister will have power to dispense with any of the requirements of the regulations, but if the requirement as to the position of one or other of these diplomas remains the Council will have to obtain the permission of the Minister when it is desired to appoint a candidate without such diploma but having the essential obstetric experience. Moreover, in inviting applications it will doubtless be necessary to refer to the regulations, and this might debar candidates otherwise suitable from applying. The proposed requirement is new in connexion with the appointment of public health staff other than medical officers of health, and it is not applied to tuberculosis officers or senior maternity and child welfare officers. It is the view of the Hospitals and Medical Services Committee that the definite requirement in the draft regulation would unnecessarily restrict the Council's choice in making appointments. It is also considered that the proposed requirement in another of the draft regulations that non-medical supervisors shall be certified midwives who have been in active practice for at least three years is inadequate, that the period should be five years, and that two of those five years should have been within three years of taking up the appointment.

London Voluntary Hospitals

King Edward's Hospital Fund for London has published a set of statistics for 1935 of the work and finance of the London voluntary hospitals,[1] and has incorporated in this review a comparative account of the progress made from 1921–35, indicating the astonishing recovery of these institutions since the war, but showing also that there is still no sufficient margin to meet the cost of periodical improvements and extensions. At the end of the war large grants from public and charitable sources had to be made to the hospitals to tide over their immediate deficits: thus in 1920 King Edward's Fund gave £250,000 in addition to its annual distribution, and the National Relief Fund gave £200,000; in 1921 and 1922 about £225,000 was supplied from the Exchequer. The total general hospital maintenance income rose from £2,751,000 in 1921 to £4,190,000 in 1935, the annual average income for the five years 1931–5 being £3,971,000. During these

[1] King Edward's Hospital Fund, 10, Old Jewry, E.C.2. (1s. net, 1s. 3d. post free.)

five years, the first three of which felt the full force of the widespread financial difficulties, subscriptions and donations maintained a steady level at between £952,000 and £987,000, a level of nearly £200,000 above the receipts from this source in 1921. In this period, moreover, receipts from patients showed a continuous increase, the total in 1935 being £275,000 over that in 1930. The number of pay-beds rose by approximately 1,000 between 1921 and 1930, and have since increased by about 600 to a total of nearly 2,000 in 1935. The increase in total ordinary income in the fifteen years has been about £1,200,000, or nearly 48 per cent. There is no evidence of any falling off in legacies, the annual average for the five-year period mentioned being fully £450,000, while a figure of £500,000 was reached twice in this period. The increase since 1921 in the total general fund income has been approximately £1,450,000, or fully 52 per cent. Expenditure in the years under review grew greater owing to the expansion of work, and details are given in the report of the various causes for this, including the necessary provision of larger staffs and other lines of expansion. In 1921 the number of beds was 13,300, and since then it has steadily risen until in 1935 there were 18,020. The number of new in-patients rose from 172,200 to 274,100 in 1935, of new out-patients from 1,545,000 to 1,872,000, and of total out-patient attendances from 6,661,000 to 9,777,000, even though efforts have been made in recent years to discourage the attendance of patients suffering from minor disabilities. The number of new out-patients seems to be nearing its maximum, for the greater proportion of this increase occurred in the first ten years of the period under review, the rise since 1930 being only 52,000. The number of out-patient attendances is still rising, due to the development of out-patient departments on consultative lines and to the provision of specialized long-term treatments. There has been an aggregate credit balance in all except two years in respect of current finances, but capital expenditure is increasing owing to rebuilding, extensions, and major improvements in equipment. It is here that the margin is inadequate, and continued and generous support is still urgently needed. There has been an astonishing growth in the voluntary payments by patients direct to the hospitals and through patients' societies. The Hospital Saving Association, founded in 1922 with the backing of the King's Fund, has now a membership of over 1,600,000 throughout the country. So important have the voluntary payments by patients now become that they approach in amount the income derived from gifts of the charitable public, which was £1,836,000 in 1935. It is plain, therefore, that the voluntary hospitals are not dying out for lack of funds; in 1935 the total maintenance income of 145 London hospitals amounted to £4,190,000, the highest figure yet recorded, compared with £3,980,000 in 1934. In that year the total maintenance receipts from voluntary sources formed 43.8 per cent. of the total general fund income, and covered 45.2 per cent. of the expenditure. The repeated deficits reported by particular hospitals are not typical of the general tendency of hospital finances down to the end of 1935, but are due to more or less exceptional circumstances—for example, the necessity of improving building and equipment and of providing for the increased upkeep thus involved.

L.C.C. Consultant and Specialist Service

The Hospitals and Medical Services Committee proposes that the arrangements for a consultant and specialist service under the London County Council, which come to an end on March 31, shall be continued for a further year with certain modifications and additions. The number of routine sessions to be worked by consultants and specialists at grouped general hospitals has been limited to a total of 224 a week. Consequent upon the employment of two full-time radiologists at two selected groups of hospitals twenty-two sessions a week at present worked by part-time radiologists can be given up. A new authorized limit of 207 sessions a week is proposed. The salaries of all consultants and specialists under the group scheme are at the rate of £125 a year for one session a week and £75 a year for each additional session. It is found that the need for regular visits by consulting urologists does not obtain in the same way as for other specialties, and it is proposed to call them in as required and pay them on a visit basis. They will receive remuneration at the rate of two and a half guineas a visit on the understanding that during any year the payments made shall not exceed £125 for the first fifty-two visits, £200 in respect of 104 visits, and £275—the appropriate salary for three sessions a week—as the total remuneration. It is also proposed to increase the existing authority for the services of thoracic surgeons to 200 sessions a year (from 160) for the tuberculosis hospitals and to 170 sessions (from 120) for the general hospitals. A new position of consulting thoracic surgeon is to be added to the establishment of St. Mary Abbots Hospital, and some financial recognition, in the nature of an honorarium, is to be made of the services of the two consultants, associated with Lord Dawson of Penn, attached to the cardiovascular unit at Lambeth Hospital. Three of the six honorary consultants at St. Stephen's Hospital for research into selected cases of rheumatic diseases are to receive remuneration. It is also intimated that the services of neurological surgeons are likely to be more frequently required in the future; the time is approaching when consideration will have to be given to that question, but for the present the existing arrangement is to continue. The financial effect of the various proposals will be an additional expenditure of £4,423.

SCOTLAND

Sir Charles Hastings Lecture

The Sir Charles Hastings Lecture, under the auspices of the British Medical Association, will be delivered by Professor E. P. Cathcart, C.B.E., LL.D., M.D., D.Sc., F.R.S., Regius Professor of Physiology in the University of Glasgow, in the McLellan Galleries, 270, Sauchiehall Street, Glasgow, on Tuesday, February 23, at 8 p.m. His subject is "Food and Nutrition." The Secretary of State for Scotland will preside. Admission will be by ticket obtainable from the honorary secretary of the Glasgow Division, B.M.A., 257, West George Street, Glasgow.

Glasgow Western Infirmary

At the annual meeting of subscribers to the Western Infirmary of Glasgow, held on February 5, Lord Provost John Stewart, who presided, made a statement regarding the attitude adopted by the municipality of Glasgow towards the voluntary hospitals in the city. He said that if the voluntary system was not able to provide sufficient accommodation for those requiring treatment in hospital it would be the duty of the State or of the municipality to provide the necessary facilities. The corporation had appointed a committee to make an investigation to secure definite information regarding the existing position, although it had no intention of taking over the city's voluntary hospitals. Continuing, he said that the annual report of the Western Infirmary showed that the ordinary income for last year had been £73,255 and the ordinary expenditure £92,281, leaving a deficit of £19,026. There had been an increase in income, including an increase in employees' subscriptions amounting to £1,647, and he suggested that an intensive campaign should be undertaken to collect more money from the latter source. Sir John A. Roxburgh, chairman of the managers, said that last year they had been obliged to draw £8,618 from capital account. The extraordinary expenditure had been very heavy, and unfortunately it was likely that this would again be heavy during the current year, so that they must appeal for special donations. The managers proposed to

build a new wing for ear, nose, and throat wards and also wards for septic cases, as the accommodation for these two departments had for long been unsatisfactory. The Western Infirmary had not so far been able to provide accommodation for patients who were able to contribute to their treatment, but it was now proposed to erect on the east side of the main drive a block which would be available for paying patients. The plans for this building were in process of adjustment; it was expected that the building would provide some fifty beds. It was hoped that Sir Thomas Lipton's trustees would make grants enabling the managers to erect this building in memory of Sir Thomas Lipton. An extraordinary general meeting of subscribers was held after the ordinary meeting, at which a special resolution was unanimously passed giving the managers power to provide accommodation for paying patients.

Chair in Dental Surgery at St. Andrews

At a meeting of the General Council of St. Andrews University on January 30 a draft ordinance relating to a chair of dental surgery to be instituted at this university was unanimously approved. Mr. James Allison said that the ordinance provided for the endowment of a chair in dental surgery in the faculty of medicine. This had been made possible by a gift to the University Court of a sum of £17,500 by Mr. and Mrs. William Boyd, West Ferry, Dundee, in seven annual payments of £2,500, and it was hoped that an additional grant would be forthcoming from the Dental Board, which would enable a full salary to be paid to the professor. At the same meeting it was stated by Principal Sir James Irvine that the number of students at the University during the past year had been 1,062, including fifty-two research students. In the current year there had been a slight fall in the number of full-time students to 930, such a fall, however, being the general experience of all the universities. He also stated that the University had received a benefaction of £4,000 from Dr. William Low, late rector's assessor to the University Court, which had been devoted to the provision of a medical hostel in Dundee so that students engaged in midwifery could live in the immediate vicinity of the hospital.

E. F. King (*Brit. J. Ophthal.*, October, 1936, p. 561) estimates that there are fifty to one hundred cases of leprosy in the British Isles. Ten of the fourteen cases he has seen have ocular lesions, some only observable with the slit-lamp. Supraciliary thickening with loss of eyebrows, diffuse lid infiltration with nodules, and loss of eyelashes are common. Involvement of the seventh nerve reduces blinking, causes fibrillation of the obicularis, and later paralysis and ectropion. Leprosy of the palpebral part of the lachrymal gland may call for excision, and the lachrymal sac and non-lachrymal duct may be obliterated. Anaesthesia of the conjunctiva and cornea is almost constant, and an episcleral nodule in the upper temporal quadrant of the limbus, symmetrical in the other eye, is characteristic. The nodule tends to spread round the limbus and into the cornea, when an anterior staphyloma may occur and possibly perforation. A leprotic superficial keratitis with a greyish milky substantia propria and scattered white chalk-like dots is distinctive. This condition may clear with treatment. Corneal abrasion and ulceration is uncommon. Acute iritis, iritic nodule at the angle, and, most often, iridocyclitis with non-pigmented punctate keratitis, and a number of grey discrete pathognomonic spots on the iris are often seen. The iridocyclitis is similar to heterochromic cyclitis. With the exception of the deep infiltration of leprotic interstitial keratitis lepra bacilli are readily found in the various lesions. The main general treatment is the injection of chaulmoogra oil. Probably all subconjunctival injections are useless, but excision of the episcleral nodule is useful in preventing local extension.

Correspondence

Blood Group Tests in Disputed Paternity

SIR,—Dr. P. L. Sutherland's interesting letter in the *Journal* of February 6 (p. 299) raises a number of points concerning the practical side of blood group tests. As we did not discuss this aspect of the subject in our paper we would be grateful for your permission to amplify some of the points raised by Dr. Sutherland.

The particular technique to be employed for the setting up of the tests is perhaps best decided by the past experience of the individual worker in the field. Personally we prefer a modification of the Martley–Roche Lynch technique, which has proved satisfactory in our hands.

We are in agreement with Dr. Sutherland regarding the necessity of having blood of all types for control purposes and for the supply of test corpuscles and sera. We make a practice of having readily available a sufficient number of volunteers (laboratory staff, students, etc.) whose blood types have been determined repeatedly, and we think that freshly prepared corpuscle suspensions from normal individuals of established type are decidedly superior to those prepared from chance specimens of pathological bloods submitted for Wassermann tests and other tests as is suggested by Dr. Sutherland.

The necessity for controls is even greater in M and N tests than in A and B tests, since the agglutinins for M and N are not present in man and have to be developed artificially in the rabbit. Such rabbit sera may contain the agglutinins for A and B, developed as a result of the injection of the appropriate red blood corpuscles, and such agglutinins have to be removed by adsorption with A and B corpuscles before the sera can be used in testing for the M and N factors. As the agglutinins for M and N are not present in human sera there is no cross check as exists with the A and B factors, so it behoves the worker to make doubly sure of the specificity and potency of his M and N sera by exacting controls, especially, too, as rabbit anti-M and N sera deteriorate in an irregular manner.

It is our practice to have available a sufficient number of persons whose blood types were originally determined from sera kindly supplied by Professor Thomsen of Copenhagen. These known type bloods are used for the preparation, adsorption, and testing of our antisera. For the actual tests we believe that unless bloods are available from persons who are known to be M, N, or MN, it is essential, when examining a set of unknown bloods, to test them with sera from two different sources, but this only "second best."—We are, etc.,

DAVID HARLEY.
G. ROCHE LYNCH.

St. Mary's Hospital, W.2, Feb. 8.

Nasal Sinusitis in Children

SIR,—In the *Journal* of January 2 (p. 24) there was reviewed some excellent work on this subject done by Mr. Crooks, who contributed an article to the December issue of the *Archives of Disease in Childhood* (1936). From both the original work and the leading article in the *Journal* I gained the impression that Mr. James Crooks's very complete investigation of his cases in Edinburgh had compelled him to the conclusion that adenectomy and tonsillectomy resulted in only a very small proportion of cures in sinusitis. I had reached much more hopeful conclusions after some few years' investigation of this subject, and since my work was on children living under conditions different from those of the Edinburgh children,

both as to climatic and food factors, I thought it might be of interest to relate my findings and the reasons for reaching them.

In Brisbane, Australia, between the years 1926 and 1934, some six thousand children ranging up to 12 years in age had both antra aspirated into a 10-c.cm. syringe just before adenectomy or tonsillectomy, or both. When pus was found to be present in one or both antra the children were reviewed six weeks after the operation. I have one set of figures comprising five consecutive years' work showing that at this review 62 per cent. of children so inspected were considered on clinical grounds to have healthy sinuses. Of these some 7 per cent. subsequently showed signs of sinus involvement, so that in any case close on 60 per cent. appeared to have completely recovered. These children live in a subtropical zone, where there is abundance of sunshine throughout the year, where overcrowding is a negligible factor, and under social conditions in which, though there is a high cane-sugar intake, there is also a high consumption index for fresh meat, eggs, butter, green vegetables, fruit, and warm milk. One peculiarity of the Brisbane population (from which these children were drawn) is the abnormally high apparent incidence of sinus infection as compared with figures published for populations living in Europe and North America. As far as I am aware, no survey has ever been made on the matter in any part of Australia.

Last year, at the New York Academy of Medicine post-graduate course in diseases of the respiratory tract Dr. Porter, the instructor in otology at the Harvard Medical School, expressed himself in regard to sinusitis in children in terms which fairly accurately represent my own conclusions. He said:

"The nasal mucosa in children, although the seat of chronic infection, shows much greater recuperative powers when proper drainage is established than is the case with adults. In obtaining a cure frequently all that is necessary is to remove the infected tonsils and adenoids and then follow this with occasional treatments of shrinkage and treatment of the nasal mucosa. For some time thereafter it is necessary to have the patient report for treatment during an acute nasal infection. *Occasionally* it is necessary to resort to radical measures in children to the extent of exenteration of the ethmoid and some form of radical antrum operation. These proceedings are well tolerated and often produce truly surprising results. Sometimes it is advisable to do a partial submucous resection of the septum even in children."

Latterly I have come to suspect that tonsillectomy and adenectomy will give place to more scientific dietetic adjustments in the relief and prevention of these conditions: at present it seems that the same measures applied in different communities in the world produce widely divergent results (Dr. Porter's word "occasionally" gives a decidedly optimistic note), and that to me suggests the likelihood that the biochemist will eventually prove of greater value than the surgeon in cases of sinusitis in children.—I am, etc.,

Luton, Feb. 2. J. A. R. MURPHY, F.R.A.C.S.

School Medicine

SIR,—With reference to school medicine, I should be grateful to any British colleagues who would kindly let me have their opinion and experience on the subject of the practical organization of school medical inspection, especially as regards (1) its importance in preventive medicine and (2) the organization of physical education. As I have to present a report on this subject to the Société Médicale Belge de Physiothérapie any information would be welcomed.—I am, etc.,

Natoye, Belgium, Jan. 30. VICT. DE RUETTE, M.D.

Cancer of the Breast

SIR,—Mr. Sampson Handley complains that in my letter (*Journal*, January 30, p. 242) I have made indefensible claims for the hospital which he is good enough to say that I "adorn." My remark was that "radium technique began to be developed at St. Bartholomew's Hospital about twelve years ago." This is merely a statement of fact, and I should not have thought it was capable of the construction that Mr. Handley chooses to put upon it. Radium treatment had not been used at my hospital before that time, and nothing more is stated or implied in the words used. In the rest of the sentence as printed I am made to say "its value and limitations in cancer of the breast *began* to be fairly clear." What I wrote was "*begin* to be fairly clear," and possibly some slight ambiguity may have been introduced by this mistake in the typescript. I am well aware that Mr. Handley had used radium before this, though in an entirely different way, and I hope he will be content with this explanation, as I regard all discussions on priority as being valueless.

Having started with a misunderstanding, Mr. Handley then attributes to me a view I have never maintained—namely, that "radium alone" is to be the chosen form of treatment. My only object has been to ascertain exactly what might be the value and limitations of radium. —I am, etc.,

London, W.1, Feb 8. GEOFFREY KEYNES.

SIR,—Knowledge and practical experience of the three methods of treatment of breast cancer (operation, *x* rays, and radium) can hardly be possessed in equal measure by any one medical man; so a symposium, as the discussion in your columns following the valuable paper by Mr. Cecil Rowntree seems to be developing into, is the only way in which a wide and undistorted view can be obtained of the best methods in current practice.

My own experience, based on about two hundred new breast cases seen yearly, leads me to offer the following suggestions.

1. For all operable, borderline, or inoperable (surgically or medically) cases a first trial of the response to a well-planned and executed course of *x* rays to the primary and the whole of the lymph-drainage areas.

2. In six weeks to three months after the end of the *x*-ray course all signs of the disease may have disappeared, or only a small residue be left of the primary; if so, wait a further period, with monthly or less frequent examinations.* If the response is inadequate to a full *x*-ray course more *x* rays (perhaps by another method—for example, lower intensity and longer time), interstitial radium, or local or radical mastectomy should be considered (possibly followed with further *x*-ray treatment at longer intervals, as after primary operation cases).

3. For cases of local recurrence after operation deep *x* rays should similarly be tried in the first instance (a number of statistical reports show five-year freedom from signs in inoperable cases of from 20 to 36 per cent.), or low-voltage "contact" *x*-ray therapy for small isolated and superficial nodules. If the response is incomplete interstitial radium may then be tried; or operative removal be attempted and followed by *x* rays or surface radium.

4. For all metastatic cases—in the bones, chest, abdomen, or elsewhere—as deep *x* rays occasionally prove successful they should be tried and persevered with: the metastases may be more radiosensitive than the primary was, and even the signs of metastatic hemiplegia have been relieved (as in a case I once saw treated). Treatment may be either local (or local to the worst sites) or generalized (as by teleroentgen-therapy methods). Much alleviation of symptoms is possible in a large proportion of metastatic cases, and medicinal means may be found a useful adjuvant (as Maisin's "barcan").

* For review of results see Hutchison, E. G. (1936), *Surg. Gynec. Obstet.*, **62**, 653.

By the preliminary *x*-ray method advised above in primary and recurrent cases the risk of operation or interstitial radium causing dissemination (and some breast tumours appear to be as highly metastatic as a lymphosarcoma) is reduced to a minimum. Some cases seen after operation or interstitial radium have had such widespread recurrences or unusual metastases that dissemination has been strongly suggested though impossible perhaps to prove (except by analogy with animal experiments).

The "power" of *x* rays does not depend on the wavelength, as Mr. Rowntree seems to suggest, or, above a certain voltage, not to any practical extent; instead, their "power" depends on the various factors of dosage and the method and skill of application employed. The good results obtained in skin epithelioma with low-voltage *x* rays, high-voltage *x* rays, or with radium appear to prove the relative unimportance of wave-length (if suitable cases and technique are chosen) as compared with quantity absorbed and the time factor.

Such great advances have been made in the methods and technique of *x*-ray therapy in breast cancer in recent years that I am in warm agreement with the opinion expressed by a well-known radiologist from abroad at an informal discussion on the methods possible for the treatment of cancer of the breast: "Well, *x* rays for my friends!"—I am, etc.,

London, W.1, Feb. 6. J. H. DOUGLAS WEBSTER.

Sclerosing Submucosal Injection of Turbinates

SIR,—On the importance of conserving the ciliated surface of the nose everyone will agree. I heartily endorse Mr. C. A. Hutchinson's condemnation of the electrocautery as a means of removing unwanted tissue, but I venture to raise a doubt as to the method proposed by him (*Journal*, January 9, p. 72), or that of Dr. James Adam (January 30, p. 245) being the best alternative.

If the turbinates are too large they may be "tucked" by snipping or snaring away the redundant portion not only with complete safety and a quite negligible scar but without interference with the histological structure of the erectile tissue of which they are composed, and whose function is perhaps not yet quite understood. It is remarkable how great an effect a quite small button removed in this way can have on the freedom of the passage. The method is so simple and so surgical that I can see no reason for devising sclerosing injections.

As to pushing a cautery into the turbinal tissue, this method had a vogue about twenty-five years ago but was found to be dangerous. Cases were reported where pyaemia supervened. The cause was not far to seek. The cautery caused a local necrosis in the middle of a venous structure, the necrosed tissue became infected, and the ideal conditions for supplying bacteria to the blood stream were established.—I am, etc.,

Dublin, Feb. 2. ROBERT H. WOODS.

Inhalational Therapy

SIR,—I was interested to read Dr. Ellman's letter in your issue of January 30 (p. 244) and his appreciative reference to the timely leading article on the subject in the *Journal* of January 23.

As a member of the small band of pioneer workers formed in 1928 for the study and investigation of inhalational methods of medication, I regret that the British society (which numbered among its members some leading general practitioners) came to so untimely an end after a brief existence for lack of support by members of our profession. The journal of the society published a few valuable and informative articles on inhalation therapy by Continental writers, but the good work the society might have done was handicapped by events peculiar to all new movements not really understood, and to circumstances which a small but enthusiastic band of pioneers in "blazing a trail" must necessarily find themselves liable to. It is gratifying, therefore, to learn that this branch of physical medicine has recently aroused a wider and keener, if belated, interest. The treatment by inhalation of finely nebulized vapours and pharmacologically active drugs is so comparatively new to this country that it is not surprising that this important branch of medicine has had to meet criticism and objections, and to meet them with little material or clinical data for replying to them. I have used the words "in this country" advisedly, for nearly the whole of the work and most of the literature on inhalation therapy has been done and published by Continental scientists. Their investigations appear to have been founded on both sound scientific research and clinical observation.

If the study of inhalational therapy is to be successful here and if the methods employed for the relief of diseases, more especially those of the respiratory tract, are to commend themselves to the general practitioner, it is obvious that an appeal should be made to him through the proper channel and the opportunity be given him of testing its principles by his own experiences. If this method of treatment is to be of service in the only way it can be—namely, as a valuable adjunct to the medical man's armamentarium—it must fit itself to the needs of his daily practice, but at the same time it must not neglect to incorporate within itself all the best results which treatment of the orthodox kind has produced or may produce. Such orthodox treatment in the case of such a disability as asthma cannot be founded on any specific method, for, indeed, no specific remedy for asthma at present exists. Each case is a problem on its own, whether the attacks are to be considered allergic in character, of a toxaemic nature, due to vasomotor instability, to a biochemical factor, or to be of psychological origin, etc. After an experience of the past seven years in inhalational therapy I am satisfied it has, or should have, its place in physical medicine if and when combined with "orthodox" treatment of diseases of the respiratory tract. Among other remedies I have found deep breathing, remedial exercises (expiratory type), the Dowling pack, the Proetz method, and especially the inhalation of carbon dioxide (7 to 10 per cent.) with oxygen (to which your leading article called attention) of considerable service.—I am, etc.,

London, S.W.1, Feb. 1. B. BURNETT HAM, M.D.

SIR,—I was pleased to see in a leading article in the *Journal* of January 23 (p. 175) a reference made to the Duke-Fingard inhalation treatment, and was interested to read Dr. Ellman's comments the following week on the value of inhalation therapy for chronic respiratory disease. I am of the opinion that inhalational methods are extremely rational and worthy of fuller consideration.

During the past twelve months I have observed some dozens of cases treated by the Duke-Fingard method, and have been impressed with the very encouraging results obtained. The treatment consists in the inhalation, usually while the patient sleeps, of a warmed, dried, and medicated air, produced by an apparatus charged with a solution composed of phenol, creosote, glycerin, iodine, and essential oils. The room in which this is taken is rendered as

airtight as possible, and the apparatus is attached to an air inlet by the window. In a short time the room is filled with a pleasant-smelling and non-irritant vapour. Infection in the respiratory tract is unquestionably reduced in nearly every case, with the consequent disappearance of symptoms. I have seen cases of chronic widespread sinusitis, confirmed by a lipiodol *x*-ray photograph, improve immeasurably, as shown by a further *x*-ray film. Many chronic bronchitics and asthmatics have responded in a remarkable manner. At the same time I have not seen any ill effects even after a prolonged inhalation of this vapour. I venture, therefore, to hope that this particular form of treatment will receive some recognition in the near future—I am, etc.,

London, W.1, Feb. 3. J. RAYMOND THORNTON.

*** In the leading article referred to by Dr. Thornton we stated: "It seems premature, however, to decide that the results obtained with the Duke-Fingard treatment 'appear to be permanent' or that the treatment is in any sense a cure. The history of asthma and tuberculosis is a long record of premature publication and over-optimism, and it is a pity that a treatment of this kind could not have been submitted for trial to the Asthma Research Council or the Therapeutic Trials Committee of the Medical Research Council, with precise details of the formula, before an appeal was made for public subscriptions."—ED., *B.M.J.*

"Rachi-resistance" and Spinal Anaesthesia

SIR,—I doubt whether the interesting article by Dr. W. R. Black and Mr. G. A. B. Walters (*Journal*, January 30, p. 218) will convince anaesthetists of the existence of "rachi-resistance." The rare failures of spinal anaesthesia can usually be explained by anatomical peculiarities or errors in technique. An example of the latter which is sometimes unrecognized is the sterilization of the syringes and needles in boiling tap-water. In certain districts the alkalinity is sufficient to render the anaesthetic solution inactive. This applies especially to the hypobaric percaine technique.—I am, etc.,

London, N.W.8, Feb. 5. C. LANGTON HEWER.

Estimation of Coagulation Time

SIR,—The paper by H. Trought and J. W. Riddoch (*Journal*, December 12, 1936, p. 1194) on a simplified method of estimating the coagulation time of the blood prompts me to describe a method which I have been using for thirty years. I was taught Wright's technique in Sir Almroth's laboratory in 1907; the method to be described is based on the original technique.

Glass tubing is drawn out into a capillary (not too fine) at one end; the other end carries the usual teat. The tip of the patient's finger is pricked so as to assure a good flow of blood, and blood is drawn up by means of the teat till the capillary is nearly filled. The capillary is then taken from the drop and the blood drawn up, by means of the teat, to an inch or more from the end. The end is sealed off in gas or spirit flame, or plugged with wax (or soap even). The time is noted, and the tube and teat placed in the incubator at 37° C., or immersed in a jug of water at approximately that temperature. After five minutes the tube is taken from the incubator and the teat removed; then a scratch is made with a file about an inch above the end of the blood column. Break the end off; if a thread of fibrin does not stretch out between the two ends coagulation has not yet taken place. Continue the scratch-and-break process every half-minute. The first appearance of the thread gives the coagulation time. Any time below six minutes can be taken as normal.

It is well to fill two capillary tubes at about one minute's interval, using the second as a control. Most of my work has been done in connexion with the removal of tonsils. I have not had a single complaint.—I am, etc.,

ALFRED E. FINCKH, M.B.

The Sydney Clinical Research Laboratories,
Sydney, N.S.W., Jan. 21.

Injection Treatment of Hernia

SIR,—The letter on injection treatment of hernia by Mr. E. W. Archer in the *Journal* of January 30 (p. 246) has prompted me to write and confirm what he has to remark on this question. I have recently carried out some experimental work on this subject at the Buckston Browne

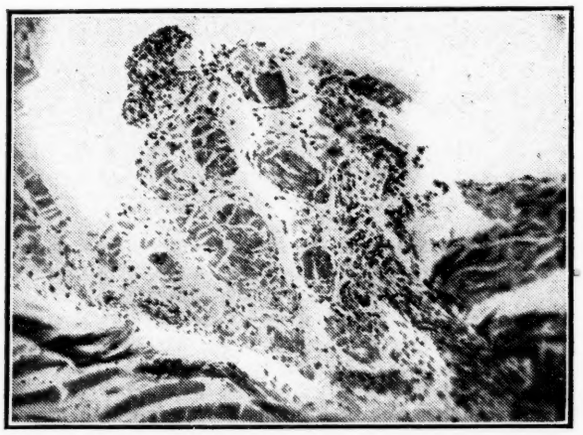

FIG. 1.—Section of the injected area after one week. The muscles are being infiltrated with cells.

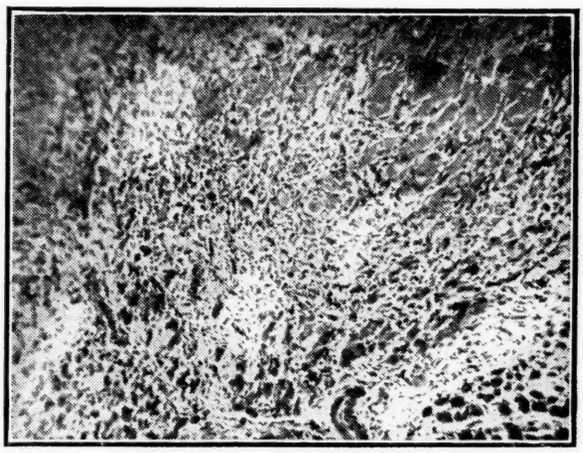

FIG. 2.—Section of the injected area after the third week. The muscular tissue is almost replaced by cellular infiltration which is going on to fibrous tissue formation.

Experimental Laboratory, through the courtesy of Dr. John Beattie of the Royal College of Surgeons of England.

White rats were used, and were injected in the lumbodorsal region with a sclerosing fluid (quinine-urethane and lithocaine). The rats were killed at weekly intervals, and the area injected was cut out and examined microscopically after the usual preparations. Two of these slides are shown, and it will be seen that there is much more consolidation of the fibrous tissue in Fig. 2 than in Fig. 1. thus showing that the injected solution leads to a definite fibroblastic reaction. The same change occurs in the hernial canal when the same solution is injected into it.

Mr. Archer quotes a case where the hernia was cured by five injections. He is very fortunate to have had such

a good result, as I have never seen a case cured in such a short time. It therefore makes me wonder whether he is using a stronger solution than my own. It is surprising that this method of treatment has not been given further consideration in this country. In America the claims of success for this method of treating hernia are very high, and in some centres injection clinics for hernia have been instituted. It is to be hoped that some investigation in this method of treating hernia will be raised in this country, and that this valuable line of curing ruptures will be put on a sounder basis.—I am, etc.,

London, W.1, Jan. 31. MAURICE LEE.

A New View of Pneumonia

SIR,—Many years ago the old view of pneumonia as a disease of the lungs which made a man very ill gave way to the larger view that it was a grave general illness with a particularly bad effect on the lungs. Then the view was taken that the most dangerous action was on the heart, and digitalisation was tried. Lately the view has come into prominence that the peripheral circulation is the weak spot. I wish to emphasize the ill effect on the central nervous system in general, and particularly on the respiratory centre.

It is surely not without significance that in his excellent article on the treatment of pneumonia published in the *Journal* of December 22, 1934 (p. 1159), Dr. Wynn chose the nervous system for his first remarks on symptomatic treatment. He states that in the earliest stages—not, be it observed, only in the later stages—the patient shows restlessness and mental anxiety, and requires nerve sedatives. The marked effect on the brain of apical pneumonia which is mentioned in all text-books is only an exaggeration of what occurs in all cases. The practitioner unconsciously expects his pneumonia patients to show semi-coma and delirium to an extent which he does not anticipate in other equally febrile conditions. The inevitable occurrence of delirium tremens in the alcoholic subject shows the action of the pneumococcal toxin on a damaged brain. Finally, many doctors must have been shocked by the disastrous result of a night of sleeplessness and delirium when a sleeping draught has been omitted or been inefficient. In all this there is nothing new, but it does emphasize the necessity for treating the nervous system, which fortunately can be done, whereas no drug can benefit the inflammation in the lungs, and cardiac tonics have proved useless.

A really new point emerges, however, from a study of the respiration in this disease. It is a commonplace of the text-books that from the first the pulse-respiration ratio is altered—that is, that the patient is breathing faster than would be expected merely from the raised temperature. This might be accounted for by the pain of pleurisy were it not that, first, it occurs when there is no painful pleurisy; secondly, that it does not cease if such pain is relieved; and thirdly, that it is entirely unlike the respiration seen in acute pleurisy from other causes. The increased respiration cannot be accounted for by the lung condition at this early stage, when physical signs are hard to find, nor at this stage by cardiac weakness. The only explanation left is stimulation of the respiratory centre by the pneumococcal toxin. The decisive evidence in favour of this view is obtained from a consideration of the respiration immediately before and after the crisis. The character of the breathing immediately after the crisis shows that there is sufficient undamaged lung tissue for quiet, easy respiration, and as it is impossible to imagine that there has been a great change in the lung condition during the preceding few hours, this area of undamaged lung must have been available to the patient before the crisis, but he did not use it. His respirations were hurried, forty or more to the minute, and dangerously shallow. The fall of temperature might account for some decrease in the rapidity of the respiration, not for all of it, and will not account for the entirely changed character of the breathing. The explanation clearly seems to be that at the crisis the pneumococcal toxin has ceased to overdrive the respiratory centre. It began to do so from the first, as we have seen; it continued to do so with increasing force till either the centre was completely exhausted, respiration inefficient, the circulation hopelessly disorganized, and death occurred; or, happily more often, the toxin ceased to act and the centre was able to use beneficially the remaining undamaged lung tissue.

The question naturally arises, Does this view of pneumonia afford us any indication for treatment? It must strongly emphasize the importance of the two things that are known to slow the respiratory rate—morphine and sleep. The question of oxygen inhalation may have to be thought out afresh. Indeed, it would seem that there is a call for inhalation of carbon dioxide to secure deep respiration, according to the practice of the anaesthetists.—I am, etc.,

Birmingham, Feb. 4. W. A. MARRIS, M.D.

Silicosis and Respiratory Poisons

SIR,—Dr. Blacktin has been good enough to refer in his letter of January 23 to my views with regard to the microbiological aspect of atmospheric pollution. Silicosis is generally regarded as a mechanical or a chemical disease, but is seldom, if ever, discussed as a microbiological one. I have previously suggested that in reality it is a microbiological disease,[1] and regretted my inability to study silicosis at the present time. In numerous letters[2] I have drawn attention to the number of micro-organisms in rain waters collected in rain-water gauges, to the fact that I find that the black on buildings is a fungoid growth and not soot, and that biological growth is responsible for a large part of geological formation other than that of an igneous nature.

I believe that the characteristic feature of silicosis consists of the presence of isolated nodules of fibrous tissue. What is the composition of this fibrous tissue? Surely it is important that this should be investigated. Silicosis is much more prevalent, so far as I can ascertain, in Africa and in hot climates than in cold ones; thus among gold miners in Africa more than among coal miners in this country or in Canada.

Bauxite is the end-product of the decomposition of igneous rocks, of sedimentary rocks, and of metamorphic rocks, all of which contain on the average from 40 to 60 per cent. of silica. These same rocks are found in tropical and in temperate climates, but in the latter the end-products of decay appear to be sand (silica), the other elements being carried away in rivers, whilst in hot climates the silica is the substance carried away in the water. If, then, the decay of these rocks is largely a microbiological process, is it not probable that silicosis is the result of the growth of the type of micro-organisms which dissolve out silica, and that where other types of organisms predominate silicosis is less likely to occur? I venture to send you this thesis because I feel that it is one which should be explored, but I must advise investigators that it will demand very careful technique for its solution.

Now if I may be allowed one or two further comments on the letters of Drs. Goodfellow and Blacktin, I should like to inquire what evidence there is that coal exerts any antiseptic action at all. So far as I can see coal is the end-product of the type of decay caused by the cladosporium and penicillium type of organism, all of which dissolve out the metallic radical but not silica; therefore one would not expect silicosis to be so prevalent among coal miners. This is quite a different explanation from

[1] *Chem. Indust.*, 1936, p. 213.
[2] Ibid., 1935, p. 1100; *Times*, September 16, 1936; *Manufact. Chem.*, 1936, p. 414.

the one put forward by Dr. Goodfellow and accepted by Dr. Blacktin. With regard to Dr. Blacktin's suggestion that coal adsorbs poisons, I should be glad to know what evidence there is that the surface of coal, even in minute particles, is such that it possesses any adsorbent properties. It seems to me that a possible explanation of cause and effect is being entirely overlooked.—I am, etc.,

London, W.C.1, Feb. 4. THOMAS MCLACHLAN.

Faints and Fits

SIR,—Dr. A. Rae Gilchrist's lecture (*Journal*, January 30, p. 203) and Dr. Broderick's letter (February 6, p. 300) on this subject remind me of an experience of mine, twenty or thirty years ago, which shows the importance of distinguishing between fits and faints, whatever may be their primary origin.

I was travelling in a railway train when an old gentleman who had been reading a newspaper and smoking a pipe suddenly collapsed. I went to his assistance, and at first thought that he was dead. I succeeded, however, in reviving him, and thought that he had had a bad fainting attack. I sat down beside him in view of any possible recurrence. After a little time, when he seemed quite recovered, he stretched out his hand and took hold of my hand. I thought he was going to thank me for my attention, when, to my surprise, he carefully selected my index finger and proceeded to use it to clean out the bowl of his pipe. I induced him to adopt another method, and he gradually recovered his intelligence. For several years he and I usually travelled to London and back by the same trains, and he occasionally had similar attacks. On one occasion he had an attack just before the train went into Cannon Street Station. He started in a "subconscious" condition to go through the traffic to the Stock Exchange, where he worked, but I persuaded him to go with me and rest for a while in the waiting-room.

Another time he had an attack near his home station. I got him out of the train, and called a porter to look after him. Suddenly he turned and insisted on getting back into the train. As the train was beginning to move I was in an awkward dilemma, but just at that moment a fellow passenger handed out his beloved pipe, which was being left behind. I gave it to him and all was well.

—I am, etc.,

Lingfield, Feb. 7. HUGH WOODS, M.D.

Is National Intelligence Declining?

SIR,—I was very much interested in the searching commentary appearing in an annotation in the *Journal* of December 5, 1936 (p. 1150) concerning my recent research on mental capacity and the differential birth rate. There are certain misapprehensions, however, to which I feel some response is required.

There seems to be current in the medical world the remarkable notion that the older an intelligence test is the better it must be. The Binet test was rejected as an instrument in my survey because, being the first intelligence test invented, it takes no account of all the profound advances that have resulted in mental testing through the researches of Professor Spearman and his co-workers. The Otis test was rejected because it is an American test having a standardization which is about fourteen points out for English children. I will not enlarge on these technicalities here since I have done so in my *Guide to Mental Testing*, but any critical examination of the test actually used will show that the charge of being "either unreliable or not satisfactorily standardized" applies rather to older tests and associated conceptions of the scatter of intelligence than to this latest product of painstaking research.

That the conclusions are, as you say, depressing to anyone having the welfare of the country at heart is a very mild statement of the position, but the way out does not lie in attempts to undermine confidence in the scientific soundness of this or any similar investigation; it lies in further investigation on a larger scale, followed by very definite action. I trust that this criticism of the over-optimistic tone in which your commentary dismisses some of my conclusions will not be mistaken for any lack of appreciation of the valuable suggestions regarding possible errors in statistical technique. These possible loopholes I have examined fully in a more lengthy treatise concerning this problem and the methods whereby it may be handled through social and medical services, entitled *The Fight for Our National Intelligence*, which has recently been published with an introduction by Lord Horder.—I am, etc.,

Education Department, Leicester, Feb. 2. R. B. CATTELL.

Intraperitoneal Haemorrhage from a Graafian Follicle

SIR,—With reference to Mr. R. R. M. Porter's letter on intraperitoneal haemorrhage from a Graafian follicle, may I mention that I saw a similar case about six years ago when I was an assistant at the City Hospital in Spremberg, Germany.

A young married woman was suddenly taken ill with intense abdominal pain, vomiting, collapse, etc., and was admitted shortly afterwards to the hospital. She looked very pale, had a rapid, feeble pulse, low temperature, and some rigidity and tenderness of the lower abdomen. After diagnosing a ruptured ectopic pregnancy (of which we saw an unusually large number at that particular hospital) a laparotomy was performed.

We found both tubes and the uterus normal, but there was a steady bleeding from a small ruptured Graafian follicle. The amount of blood in the abdomen was comparatively little. After wedge-shaped resection of the follicle the defect was repaired and the abdomen closed. Recovery was uneventful. A microscopical examination was not made as there was nothing suggestive of an ovarian pregnancy.

I apologize for not being more exact, but I am reporting the case from memory only.—I am, etc.,

Stoke-on-Trent, Feb. 8. S. KLEIN, M.D., F.R.C.S.Ed.

Ducks and Bilharzia Disease

SIR,—While domesticated duck feed greedily on bilharzia-infested snails in South Africa, I was able, when working under the Streatfeild Research Scholarship, to show that they could not be persuaded to devour examples of *Melanoides tuberculata* Müller. This widely distributed shell harbours a non-human schistosome in Egypt, but evidence is wanting that it is concerned with the spread of bilharzia disease, at any rate in Southern Africa. Professor G. A. H. Rose tells me he experienced the same difficulty in persuading domesticated duck to devour the stout shells of schistosome carriers in China.

The African jacana, *A. capensis*, whose native name in Zululand is Matanda etuba, might well be protected, for this bird visits all pans and feeds on the snails from water-lily leaves. But it is unreasonable to administer fines for the capture of wild birds by semi-starving natives, in which condition they themselves serve as carriers of disease, and greater consideration should be paid to the conservation of forests and the cultivation of native lands in tracts of country where bilharzia disease is rife.—I am, etc.,

F. GORDON CAWSTON, M.D.

Durban, South Africa, Jan. 6.

Schools for the Physically Defective

SIR,—Dr. J. W. Brown is reported in the *Journal* of February 6 (p. 290) to have told the Royal Society of Medicine that it was a great mistake to place children with a cyanotic type of congenital heart disease in special schools with the mentally defective and backward: they should be encouraged to go to ordinary schools, even if only part-time.

Dr. Brown seems to share the all too common misconception that there is only one sort of special school, that for the mentally defective. As a matter of fact the special (M.D.) school is only one of several different kinds of special school, and the criterion for admission to it is that the child "is feeble-minded . . . but is not incapable, by reason of mental defect, of receiving benefit from instruction in a special school. . . ."

On the other hand, experience of the special (physically defective) school has convinced me that such a school is the place of choice for the education of children with congenital heart lesions accompanied by cyanosis. First, because I think they are less likely to develop a sense of inferiority if they mix with children as severely handicapped as themselves: secondly, because many ordinary schools are at the top of quite high buildings: and, finally, because they obtain in these schools a technical training in a suitable handicraft such as tailoring or watch repairing.—I am, etc.,

Chichester, Feb. 8. J. L. NEWMAN.

B.M.A. and T.U.C. Joint Committee

SIR,—The announcement of a joint committee being formed of representatives from the British Medical Association and the Trades Union Congress (*Supplement*, February 6, p. 68) is a matter for congratulation to both parties. The dispute at Llanelly will have had a most happy outcome if as a result this new committee becomes what many of us believe to be not only possible but desirable. The work that lies before it spreads out into the whole realm of social medicine, and includes a study of the innumerable factors in economic life that underlie the attainment of a healthy community. Not least of its functions will be many matters connected with industrial medicine, and in this sphere the committee will not lack willing collaborators.

One important aspect must not be overlooked. In the not too distant future Europe may be faced with the greatest crisis of its evolution, and at the moment nothing is more important than that strong links should be formed between all progressive elements whose aim is the maintenance and improvement of community and individual health, physical and mental. On the strength of those links, however small they may appear, will depend in the last resort the type of society that emerges over the next few decades. The fact of medicine linking itself in a co-operative undertaking with organized labour is a matter of outstanding importance. This arrangement need be in no way exclusive, and must certainly not be political except in so far as politics is the consideration of means to attain agreed ends. There is everything to be said for other and similar arrangements with organizations representative of educational, technical, and economic interests. This is only the beginning of a new conception of medical statesmanship, and in full realization of the difficulties that have been overcome both the British Medical Association and Trades Union Congress deserve the heartiest congratulations.—I am, etc.,

Beeston, Notts, Feb. 5. LEONARD P. LOCKHART.

International Good Will—and Organization

SIR,—I read with pleasure Dr. Bryan-Brown's letter and your editorial comment in the *Journal* of January 30. The dangers inherent in the present situation are weighing ever more heavily on all sections of the community, and our own profession, by virtue of its great influence and exceptional international contacts, can do much to create an international sentiment which will operate powerfully in the direction of peace.

But good will, though vitally important, is not enough, and the *organization* of a peaceful international polity is a practical issue of equal importance. There must be many medical men who feel, like myself, the need for strengthening the League of Nations, so that it may become the instrument of a broader international justice whilst offering real security against the risk of aggression. The difficulties are great, and demand, like the problem of cancer, courageous thought and patient research. But a vigorous effort to grapple with them is already being made. The New Commonwealth Society (Thorney House, Smith Square, Westminster, S.W.1) is approaching the whole problem in a spirit of scientific inquiry, and I should like most earnestly to commend its activities to the notice of members of the profession.—I am, etc.,

Newcastle-upon-Tyne, Feb. 3. SYDNEY HAVELOCK.

Obituary

CHARLES JAMES LEWIS, M.D., D.Sc.

Emeritus Professor of Hygiene, University of Birmingham

Dr. Charles James Lewis, formerly director of the public health laboratory of the University of Birmingham and professor of hygiene, died in a nursing home in Birmingham on February 6 at the age of 72.

After studying medicine at the University of Edinburgh and at University College, Liverpool, Lewis graduated M.B., C.M.Ed. with first-class honours in 1885, and took the diploma of M.R.C.S.Eng. in the same year. He obtained the M.D. in 1888, the B.Sc. in public health in 1900, and the D.Sc. a year later, having been elected a Fellow of the Royal College of Physicians of Edinburgh in 1895. For some years he was in general practice in Stirling, but deafness following an attack of scarlet fever decided him to make a career in sanitary science. His earlier appointments were those of lecturer in public health at the Medical College for Women at Edinburgh and the School of Medicine of the Royal Colleges. In 1905 Lewis went to Birmingham as lecturer in public health and bacteriology, and soon began researches into the colon-typhoid group of micro-organisms, on which he published several papers, and on lactose-fermenting bacilli, generally in relation to drinking-water and uncooked vegetables. His *Handbook on Public Health and Preventive Medicine*, written in collaboration with the late Sir Andrew Balfour, appeared in 1902. As associate professor of bacteriology and head of the department of hygiene and public health Lewis taught a large number of graduates taking the D.P.H. course, and many of his former students hold important positions as medical officers of health or as bacteriologists in hospitals and county laboratories. During the war he served as bacteriologist to the 1st and 2nd Birmingham War Hospitals, and did valuable work in the University when it was converted into the 1st Southern General Hospital. It was in the bacteriological

department of Birmingham University and under Professor Lewis's supervision that a thorough investigation of psittacosis was made about seven years ago. On retirement from the active service of the University in 1935 he was made emeritus professor. He joined the British Medical Association in 1888, and at the annual meeting held in Birmingham in 1911 was vice-president of the Section of Pathology.

It is with regret that we record the death of Dr. JAMES MAXWELL WARNOCK at his home in Newtownards, Co. Down, on January 31. He had been a victim of the prevailing epidemic of influenza, and had been advised to take a holiday to convalesce, but refused to leave his patients; an outcome of his self-sacrifice was that he developed pneumonia, and this proved rapidly fatal. Dr. Warnock was a student of Queen's College, Belfast, and graduated M.B., B.Ch. in the Royal University of Ireland in 1906, and proceeded to the M.D. in 1916. He acquired valuable experience in practice in England for two years and then settled at Newtownards, where he soon became one of the prominent medical men in the Ards peninsula, acting as medical officer to the Union Infirmary, which was later converted into a modern district hospital. The Ards was his birthplace, and he looked upon it with admiration; the citizens of the peninsula soon held him in equal respect and esteem in his professional activities, and the number of his patients is a tribute to his ability and character. He was universally popular with colleagues and patients, and his death is a loss to the district which held him in such high regard. Dr. Warnock was of a quiet, unassuming temperament, conscientious in the fulfilment of his duties, and always prepared to help a friend. He was a regular attender at meetings of the British Medical Association and the Ulster Medical Society. With his widow, two sons (one of whom is a doctor and the other a medical student), and his daughter there is widespread sympathy in their bereavement.

Dr. EDWARD WATSON PALIN, who died on January 19 in St. Thomas's Hospital, was aged 68 years, and had been in general practice for about thirty-two years. In 1895 he graduated M.A., M.B., B.Ch. at Oxford, obtaining the M.R.C.S. and L.R.C.P. diplomas, and then acted as house-physician and clinical assistant in the aural department at St. Thomas's. For about two years he practised at Ross-on-Wye, Herefordshire, and then settled at Fakenham, Norfolk, in partnership with Dr. W. H. Fisher. He was Poor Law medical officer for Mitford and Launditch Union. During the war he formed the Fakenham Branch of the St. John Ambulance Association and acted as medical officer. For many years Dr. Palin was a member of the British Medical Association. He was a keen Freemason and much interested in parochial affairs. He was also an expert gardener and photographer, and exhibited in London and other places. He retired to Chalford Hill, Gloucestershire, five years ago. On January 24 memorial services were held at Fakenham Parish Church and were largely attended.

We announce with regret the death, on January 31, of Dr. HENRY HOLT of Bournemouth. After studying at Owens College, Manchester, Dr. Holt qualified M.B., Ch.B. in 1900, and then went on to the Middlesex Hospital and took the D.P.H. of the English Conjoint Board in 1905. He acted for a time as house-surgeon to St. Mary's Hospital for Women and Children, Manchester, and later as house-surgeon to the Stanley Hospital, Liverpool. He was appointed assistant to the medical officer of health for Stockport, and in the course of his work there wrote a thesis on "The Place of Vaccine Therapy in the Treatment of Gonorrhoea," for which he was awarded the M.D. of Leeds in 1918. He was at one time president of the Stockport Medical Society, and first joined the British Medical Association in 1902.

We regret to announce the death of Dr. HUGH MEYRICK MEYRICK-JONES of Hauxton, Cambridge, on February 2. He received his medical education at Guy's Hospital, and qualified M.R.C.S., L.R.C.P. in 1893, and afterwards spent a few years at Crewkerne, Somerset. He took the degrees of M.B., B.S. at the University of Durham in 1896 and proceeded M.D. in 1898. In the latter year he settled in practice at Guilsborough, Northamptonshire, where he held the appointment of public vaccinator to the No. 2 District of the Brixworth Union. In 1901 he moved to Charlton Kings, Cheltenham. He became medical officer of health to the local urban district council in 1909, and held that office until 1922. In 1911 he was appointed honorary radiologist to the Cheltenham Ear, Eye and Throat Hospital and General Hospital, and in the same year he became a member of the Röntgen Society. He went to live at Cheltenham during the war, and on his retirement in 1928 moved to Cambridge, where he received the appointment of demonstrator in radiology and electrology in the University. The degree of M.A. (*honoris causa*) of the University was conferred upon him in 1931. Dr. Meyrick-Jones had been a member of the British Medical Association for forty years. He was president of the Gloucestershire Branch in 1921–2, and when the Association held its annual meeting at Manchester in 1929 he held office as secretary of the Section of Radiology and Radiotherapeutics.

Dr. GEORGE FRANCIS BRADLEY, who died at Lutterworth, Leicestershire, on February 2, received his medical education at the London Hospital, and qualified M.R.C.S., L.R.C.P. in 1911. He held a number of resident appointments at the hospital, and graduated M.B., B.S. at the University of London in 1913. He then settled in practice at Halstead, Essex, where he became surgeon to the local cottage hospital. After moving to Lutterworth he was appointed certifying factory surgeon for that district in 1931. He was also surgeon to the Lutterworth Cottage Hospital and local medical officer to the Post Office. Dr. Bradley had been a member of the British Medical Association since 1916.

Dr. THOMAS FORDE of Shapsford, Denaby, died on January 23, aged 54, from pneumonia following influenza. For over a fortnight he had worked many hours a day visiting influenza cases in the Conisborough and Denaby district, where he practised for twenty-three years. Dr. Forde was born at Cork and studied medicine there, graduating M.B., B.Ch. of the Royal University of Ireland in 1908. After several voyages as ship surgeon he practised for a time in South Wales, and held a temporary commission in the R.A.M.C. during the war. He was for many years a member of the medical staff of the Fullerton Hospital, Denaby, and surgeon to the local branch of the St. John Ambulance Brigade. He had been a member of the British Medical Association since 1912.

We regret to announce the death, on January 29, after a short illness, of Dr. ALFRED BERTRAM VINE, M.B.E., of Bury, Lancs. A student of the Middlesex Hospital Medical School, Bertram Vine obtained the English joint qualifications in 1899 and graduated M.B.Lond. in 1901. After serving as house-physician at the Middlesex Hospital he settled in practice at Bury, and for some years was honorary physician to the Bury Infirmary. He joined the British Medical Association in 1911, and was a member of the Manchester Clinical Society.

The following well-known foreign medical men have recently died: Dr. BINDO DE VEECHI, professor of morbid anatomy and rector magnificus of the University of Florence, aged 59; Geh.-Med. Rat Dr. RICHARD MAY, formerly extraordinary professor of the history of medicine at Munich, aged 74; and Dr. HEINRICH GERHARTZ, extraordinary professor of internal medicine at Bonn and an authority on tuberculosis and the cerebral nervous system, aged 58.

Medical Notes in Parliament

The House of Commons this week considered Supplementary Estimates for the Board of Education, for public education in Scotland, and for other services. The second reading of the Factories Bill was set down for February 11, and the second reading of the Registration of Osteopaths Bill, a private Member's measure, for February 12.

The House of Lords considered the Regency Bill.

The Select Committee of the House of Commons on the Medicine Duty considered a draft report.

Miss Horsburgh proposes to introduce in the House of Commons next week a Bill to control the sale in Scotland of methylated spirits and of such spirits in admixtures.

The Geneva Convention Bill, which has passed the House of Lords, was read a second time by the House of Commons on February 2 and sent to a Standing Committee. Mr. D. R. Grenfell said that in committee the Labour Opposition would move amendments to include in the Bill more direct safeguards of the rights of the Red Cross for the purpose for which it was originally intended.

The Deaf Children (School Attendance) Bill was read a second time in the House of Commons on February 2 and sent to Standing Committee.

The House of Commons in committee on February 4 approved a resolution authorizing expenditure by the Minister of Agriculture and Fisheries for the carrying on of scientific investigation or laboratory diagnosis as to diseases affecting fish of the salmon family or freshwater fish. The Diseases of Fish Bill, for the same purpose, was read a second time by the Commons on February 2.

The House of Commons gave second readings on February 5 to the Wisbech Joint Hospital District Bill and the East Hertfordshire Joint Hospital District Bill.

The Firearms Bill, which has passed the House of Lords, was read a first time in the Commons on February 3.

The Parliamentary Medical Committee has passed a resolution congratulating Sir Henry Morris-Jones on receipt of the honour of knighthood.

Maternity Services in Scotland

Mr. WALTER ELLIOT moved in the House of Commons on January 28 the second reading of the Maternity Services (Scotland) Bill. He said the Bill was intended to deal with the problem of maternal mortality, which had long preoccupied those engaged in the public health services of Scotland. A report on maternal morbidity and mortality had been issued in 1935 under the auspices of a specially appointed technical subcommittee of the Advisory Committee of the Department of Health for Scotland, and the Bill was designed to carry out as far as possible the recommendations of that report. Its object was to improve the standard of midwifery in the home in Scotland and secure adequate nursing and medical services for women who were confined in their own homes. He hoped the Bill would be found non-controversial. The death rate of six mothers for every 1,000 children born in Scotland indicated a greater degree of ill-health which could not properly be measured but was far greater than it ought to be. Some of these lives could be saved and much of the ill-health could be prevented by properly co-ordinated arrangements for attending to the health of the women before, during, and after confinement in their own homes.

Scottish doctors took a larger part in confinements than English doctors, and the Bill, taking account of this fact, differed from the English Bill. It was not limited to a midwife service, but also brought in doctors and a specialist service. Every expectant mother who desired to be confined in her own home would be entitled to the services of a midwife and doctor, and, if necessary, the doctor would be at liberty to call for the advice or help of an obstetrician of recognized standing. When a suitable period had elapsed after the confinement the doctor would visit the mother to advise her as to any treatment she might need. This post-natal examination aimed at preventing the development or continuance of conditions that might give rise to ill-health in later life. The midwife, the doctor, and the specialist would work together as a team under the general administration and oversight of the medical officer of health, whose advice would be available to doctor and patient if difficulty arose. The co-operation between doctor and midwife, on which the scheme was founded, arose naturally out of existing conditions in Scotland, but experience might make it desirable later to modify the arrangements. The Scottish practice was for the confinement to be attended by a doctor, and the Government thought it right, at any rate in the initial stages, that general practitioners should be given a chance to show that the confidence placed in them was justifiable. The Government hoped that with the midwife service and the advice of specialists at call the doctor would not be required to go beyond minor assistance.

LOCAL AUTHORITIES AND MIDWIVES

The arrangements which the local authorities would be required to make would be subject to the approval of the Department of Health. The local authorities had complained that they were being put under the control of the Department of Health. That was not so. These provisions were inserted in the Bill to ensure that the Department, the Minister, and, through the Minister, the House of Commons could keep an eye on the working of the scheme. The local authorities would have elasticity in making their arrangements, and the difficulties which certain areas had with communications would be taken into account. It would be open to local authorities to negotiate with the voluntary associations employing midwives, or to arrange with midwives engaged on private work, or themselves to establish a salaried service of midwives. Before submitting proposals to the Department of Health local authorities were required to consult the voluntary associations which employed or were willing to employ midwives in their areas, and also to consult with any organization which spoke for the midwives practising in an area. The remuneration of midwives was a point which would arise for discussion in committee. When the scheme came into operation the "handywoman" would disappear from Scotland.

The number of midwives in practice would be reduced by operation of provisions for compensation on retirement. Midwives engaged by the local authorities would be paid by those authorities or by their own associations, and would no longer have the not uncommon experience of rendering services for which they received no fee. The Bill provided that if a midwife gave up a certificate within three years after the Bill had passed she would receive as compensation three years' average income. In cases where midwives remained in practice after they had become unfit local authorities were empowered to call upon these midwives to surrender their certificate, subject to a right of appeal to the Department. Such midwives would receive five times their average income calculated on the previous three years.

Local authorities would be free to select their own methods for securing medical services so long as those services were adequate. In some areas the local arrangement would be with all medical practitioners who were willing to undertake the service. In other areas the ante-natal and post-natal examinations might be carried out at the authorities' clinics, and arrangements might be made with all the practitioners or with a limited number. Arrangements would ensure that the doctor attending the confinement was advised of the results of the examination which had been carried out before. The service offered to expectant mothers was not compulsory, but the Department expected that it would be generally taken advantage of.

PATIENT'S FEES AND PAYMENTS TO DOCTORS

Fees would be graded according to the ability of the patient to pay, and none would be charged in the case of the necessitous mother. For insured women, the wives of insured

men, and women in a similar economic position it was hoped that the financial arrangements would enable local authorities to provide a complete service at home at a fee not much, if at all, higher than was at present payable for the services of a midwife alone. Women could then authorize payment to the local authority out of the maternity benefit. The payment for services rendered by the doctors would be made by local authorities in accordance with scales fixed by the latter after consultation with the appropriate organizations of doctors. The additional expenditure when the new services were in full operation, after taking account of fees recovered, might reach £120,000 a year. Clause 3 of the Bill proposed a grant equivalent approximately to half the total additional expenditure of each local authority. The grant would be scaled up and down in proportion to the needs of the authority determined under the formula of the 1929 Local Government Act. He was prepared to move an amendment that the Bill should not come into operation until May 16, which was the day after the new block grants had begun. Local authorities would also receive Exchequer help in the amount of their liability for compensation to midwives who retire in the three years following the commencement of the Bill. One-half of the compensation paid in all cases during that period would be borne by the Exchequer.

Among the points which would arise in committee was the concern felt by the universities and teaching institutions about the cases that would be available for the training of medical students in midwifery. The Bill provided that the local authorities and the Department should have regard to the desirability of maintaining facilities for teaching.

NUTRITION AND THE BILL

Mr. T. JOHNSTON said the Opposition approached the measure with sympathy. Mr. Elliot had not explained why the Scottish maternal mortality rate was 15 per cent. worse than that in England, nor why, in a model area in London, instead of a death rate of 6 per 1,000 as in Scotland, it had been reduced to 0.68. There was nothing in the Bill about malnutrition. What provision would be made in the regulations for seeing that women undernourished from long poverty and underfeeding were provided with the necessary nutrition?

Dr. Elliot had explained that the Bill provided for the consultation of existing voluntary associations. Mr. Johnston thought this necessary in many rural parts of the country where these associations had grown up over many years and some were efficient. He criticized, however, the drafting of the provisions dealing with them. Clause 1 of the Bill said that the period of domiciliary treatment by a midwife was to be only the lying-in period. The English Act prescribed fourteen days. He discussed the working out of the new grants for maternity services in association with the block grants, and asked whether after May 16 Edinburgh would be guaranteed 50 per cent. of her expenditure on maternity services.

Mr. ELLIOT said he thought that the percentage would not be increased and might be slightly diminished under the new formula. The distribution of the money available would be according to the needs of the population, and he was willing, later, when the block grant and the weighted formula had been agreed upon, to circulate a statement showing what each local authority in Scotland would receive. The new formula would, on the whole, advantage the densely populated areas, the sparsely populated areas, and the poor areas rather than the richer ones.

INSTRUCTION IN DOMICILIARY MIDWIFERY

Mr. GRAHAM KERR said that one point of fundamental importance merited the consideration of the House. Many of those best qualified to speak on the improvement of domiciliary midwifery in Scotland told him that unless the Bill was amended at one point it would bring about actual deterioration in domiciliary midwifery. There happened to be statistical information on this matter. In 1933 a report was published in New York upon mortality in connexion with confinement based upon 348,310 cases. This showed that in cases dealt with in splendidly equipped hospitals the death rate was 4.5 per 1,000, whereas in confinements in the patients' own homes the death rate was 1.9 per 1,000. Of course in hospitals a greater proportion of abnormal cases was found, but the House was safe in taking these statistics and a great mass of similar evidence from elsewhere as justifying a declaration that the day was not yet ripe for treatment of midwifery cases in general in hospitals. As a biologist it appeared to him that no more difficult task faced society than the improvement of domiciliary midwifery. From that point of view the most important thing was to ensure efficient training in midwifery for the midwife on the one hand and the practitioner on the other. The Scottish universities and the great maternity hospitals of Scotland represented to him that the present Bill failed to ensure this. The University of Aberdeen said the omission would in the long run defeat the object of the Bill. Glasgow Maternity Hospital, the largest in the country and the largest training centre for midwives in Great Britain, said the Bill in its present form would wreck the outdoor service of the hospital, which was essential for training students and midwives. A similar opinion was expressed by Dundee Maternity Hospital, which last year was responsible for over 50 per cent. of births registered in the city of Dundee. He hoped the Government would agree to a new clause worded in this way:

In every area where there is a recognized medical school the local authority of that area and the Department of Health shall take steps to secure that adequate facilities are made available for the practical domiciliary instruction in midwifery of any person undergoing training with a view to becoming a duly qualified medical practitioner or a certified midwife.

Mr. LEONARD asked whether it was possible, since a great number of doctors did not like to share in nor did they specialize in this work, for the consultation to be conducted with a panel of practitioners who had paid special attention to the subject. He hoped that the period during which unqualified persons were prohibited from giving service would be extended to fourteen days as in the English Act. Competent opinion was that on the tenth day difficulties arose which needed to be watched. Under the Bill persons working in certain institutions were exempt from any penalty if they acted at a confinement. One such institution was a maternity home, but there were respectable maternity homes where no one was qualified under the Bill except the matron, and he did not see why penalties should not be imposed when they were imposed on other people perhaps as fully qualified as the nurses in maternity homes. The same applied to mental asylums. Why should it be necessary to make an exception in the case of a birth taking place in mental asylums? With regard to Clause 7 he asked, on behalf of the city of Glasgow, whether those who attended refresher courses would incur expense and whether that expense would rank for grant under the financial arrangements of the Bill. Additional hospital accommodation would be required for ante-natal and other purposes, and the cost of that should receive consideration at least in regard to capital charges.

Mr. ALLAN CHAPMAN said that hospitals existed for the benefit of poor persons and the former naturally sought experience for their trainees among the people whom they served. This point caused great anxiety among Scottish hospitals, and he hoped the Lord Advocate could announce some form of compromise. Extern training was of equal if not of greater importance than intern training for the object of this Bill. He therefore urged that provision should be made for external training, the mothers being protected by a requirement that a certificated midwife should always be present without exception when a trainee handled a case.

MEDICAL OPINION OF THE BILL

Sir ERNEST GRAHAM-LITTLE said an opportunity had been missed in framing the Bill. The recommendations of the admirable report on maternal mortality and morbidity in Scotland should have been more closely followed. The report stated that:

> "Ante-natal, intra-natal, and post-natal supervision should be afforded by the same medical attendant; where this is impossible the ante-natal record should be readily and immediately available to the attendant at confinement."

Almost all the provisions of the Bill dealt with intra-natal measures. That was too late. The nutrition of the expectant mother was one of the most important helps to her successful confinement. Investigation of mortality from maternity accidents in the Island of Lewis showed the mortality there was lower than in Paddington. The reasons suggested were that the fresh milk and food in Lewis made all the difference to maternal mortality. That aspect of the question was universally accepted. In the ante-natal period there were diseases and physical disabilities which only the medical man could discover. Such conditions could not be made clear unless care was taken in investigation of cases before confinement. To give the mother who was the victim of venereal disease any prospect of a healthy child and a normal confinement treatment must take place quite early, and if given throughout there was every prospect of the birth of a healthy child, as was proved by statistics.

The report on Maternal Morbidity and Mortality in Scotland recommended the provision of more maternity beds, but this did not seem to be touched upon in the Bill. Mortality in well-conducted and scientifically administered maternity homes had been much lower than in confinements in the best circumstances at the homes of patients. Queen Charlotte's Hospital had conducted in the past year observations into the prospects of mitigating the mortality from puerperal fever. During that twelve months a new drug had been tried, and the mortality decreased from 22 per cent. to 2 per cent. That kind of experiment could only be tried in well-equipped maternity institutions. He deprecated the fact that the Bill rather left the general medical practitioner out of the scheme. A year or two ago the General Medical Council sent to universities which were principally responsible for the training of medical men a circular upon the importance of increasing opportunity for obtaining practical skill in London and elsewhere. Elaborate changes had been suggested, and some had been made in the medical curriculum to meet that need. If the sphere of activity of the general practitioner was diminished the urge for improvement in his education would decrease. The Scottish report indicated dangers from measures taken at the confinement itself by a relatively ill-equipped midwife. Nothing was more dangerous than to do too much at a confinement. Ante-natal care lessened the need to interfere. He would rather spend more money upon measures for the preparation and the preceding stages than on the actual delivery, which ought to be a normal process. From that point of view the Bill would disappoint the medical profession.

Mr. GUY said Sir Ernest Graham-Little did not give full credit to the place which the Scottish Bill ensured the medical practitioner in confinements. It was discreditable that no less than 60 per cent. of the cases of maternal mortality were, in the opinion of the authors of the Scottish report, avoidable. In some cases the fault rested with the patient, but in the larger proportion there had been some carelessness or faulty diagnosis, perhaps some negligence on the part of the midwife or attendant or of the medical practitioner. Maternal mortality would in due course considerably diminish because a proper scheme was to be elaborated for training nurses, and perhaps also medical practitioners.

Mr. BUCHANAN thought the inclusion of a scale of fees to be charged to mothers according to their means might prevent the Bill from achieving its object. The poorest people were chargeable on the Poor Law, and the Poor Law doctor had to attend them when they needed a doctor. The very poor woman was usually sent to a first-class institution, and received the best medical skill. In the case of people with incomes of about £3 10s. a week the doctor was usually a very human man, and did not wish to run up an excessive bill. He therefore attended only when absolutely compelled to do so, and the result was that the woman drifted on. If an insured man was ill he was sure of free medical attention and hospital treatment. Why not extend the same facilities to the wife and child of the insured man?

REPLY TO THE DEBATE

Mr. T. M. COOPER (the Lord Advocate), replying to the debate, said that the Bill was not concerned with institutional treatment because that was covered by other measures, and the Scottish Department of Health did not overlook the advantages which could be secured from better nutrition for the expectant and the nursing mother. The Bill must be judged for the limited purpose with which it was concerned. This was provision of adequate domiciliary nursing service. It was not intended that Clause 1, Subsection 9, should render inoperative the safeguards of earlier subsections. The proposal was that if under Subsection 9 revised schemes were put into operation there should again be consultation with medical practitioners or voluntary organizations. Several members had asked about the length of the lying-in period. The Bill defined this as the period provided by any rule for the time being in force under Section 5 of the Midwives (Scotland) Act. At present the period was ten days, but if the authorities under the Midwives Act increased it to fourteen days that would be the period for the Bill.

The proposal to compensate with three years' net earnings the midwives who voluntarily relinquished their certificates, and with five years' net earnings those who were compelled to do so, was similar to the principle adopted in the English Bill. The members for the Scottish Universities justly apprehended a risk that schemes under this Bill might operate to the detriment of the teaching of midwifery to the doctor and midwife. The previous draft of the Bill, introduced last summer, made no provision for such facilities, but in the present text Clause 1 (8) provided for the maintenance of facilities. If the language of that provision was inadequate Mr. Elliot and he would be glad to examine any formula. They must adapt their legislative and administrative arrangements to ensure the continuous supply of competent trained midwives and doctors.

With regard to the clause which imposed a penalty on unqualified persons who for remuneration attended as nurses on women during ten days immediately after childbirth, he had been asked why the Government proposed to exempt from the penalty categories of persons who were set out in Clause 6 (1, *b*). The answer was that all these persons were in some recognized and responsible institution where medical assistance of a highly qualified character was readily available. He was willing to listen with an open mind to any arguments directed to that point. He thought that refresher courses might be brought within the schemes approved under Clause 1, in which case they would rank for grant; he was prepared to consult with Mr. Leonard on that matter. He did not think that it would be advantageous to make the new maternity service purely gratuitous, as Mr. Buchanan had urged. He assured Sir Ernest Graham-Little that there was no ground for fearing that the whole endeavours of the central Department and the local authorities would not be bent upon dealing with the ante-natal period, which was probably the most crucial time.

The Bill was then read a second time without a division, and committed to Standing Committee. The accompanying resolution authorizing the payment of moneys provided by Parliament to finance the proposals of the Bill was carried through Committee of the whole House without discussion.

In the House of Commons on February 1 the money resolution for the Maternity Services (Scotland) Bill was agreed to on the report stage.

Sir Ernest Graham-Little has been added to the Standing Committee which will consider the Maternity Services (Scotland) Bill.

Factories Bill

In the House of Commons, on January 30, Sir JOHN SIMON presented the Factories Bill, which is to consolidate, with amendments, the Factory and Workshop Acts, 1901 to 1929, and other enactments relating to factories. The Bill is not only a consolidating measure, it is a revising measure which will bring the provisions of the Factory Acts up to date. The main changes proposed in the Bill are as follows:

The various distinctions which exist in the present law between factories and workshops and between textile and non-textile factories are abolished, and only one term—"factories"—is employed.

Part I, which deals with general provisions as to health, strengthens the existing provisions and also introduces new proposals. The requirements as to cleanliness are made more precise. The amount of cubic space required per person is increased from 250 cubic feet to 400 cubic feet; in existing workrooms the present standard will continue to apply for five years and longer if effective mechanical ventilation is provided. In addition to requiring effective provision to be made for securing and maintaining a reasonable temperature in all workrooms, a standard of temperature is laid down for light sedentary work, and the Secretary of State is given power to prohibit the use of unsuitable methods of heating. The most important new proposals included in Part I are those for securing sufficient and suitable lighting and for the medical supervision of the workers in certain circumstances—for example, in outbreaks of disease.

SAFETY AND GENERAL WELFARE

In Part II the provisions of the existing law have been largely recast. New proposals provide for the adoption of various safety devices or arrangements; impose duties on manufacturers in regard to the construction of new machines; require precautions in the case of cranes, chains, steam receivers and containers, compressed air receivers, processes involving risk of explosion from dust or fumes, and various other matters. Specific requirements are laid down with regard to hoists and lifts.

The provisions in regard to means of escape in case of fire are considerably extended. The Bill secures that where in any factory more than twenty persons are employed in the same building, or explosive or highly inflammable materials are stored or used, effective arrangements shall be made for giving warning and for familiarizing employees with the means of escape and the routine to be followed in case of fire.

Part III deals with general welfare—that is, the provision of drinking water, washing facilities, and accommodation for clothing in certain prescribed processes, and facilities for sitting for female workers. Part IV contains important new proposals for health, safety, and welfare. The existing provisions as to the removal of dust are strengthened, while new ones are introduced to control underground workrooms in factories. Power is given to make regulations prescribing the maximum weights to be lifted by young persons and also by men and women. Part V, which relates to the notification and investigation of industrial accidents and diseases, reproduces substantially the existing law.

HOURS OF EMPLOYMENT

Part VI deals with the hours of employment of women and young persons. At present women and young persons may work in any week up to a maximum of sixty hours in non-textile (fifty-five and a half in textile) works, exclusive of intervals for meals, and, in addition, women may under the present Act be employed on a limited amount of overtime in certain trades. The Bill secures that the weekly working hours shall not exceed forty-eight, and that the daily working hours shall not exceed nine, exclusive of intervals for meals. Every factory will be permitted, in the case of women and young persons over 16 years, an aggregate of one hundred hours overtime in the year, provided the overtime is not more than six hours in any week and only takes place during thirty weeks in the year. Overtime for women may be increased to 150 hours in trades subject to seasonal or other pressure, and in proper cases the requirements as to the weekly maximum and the number of weeks may be relaxed. Young persons under 16 are not to be allowed to work overtime, and provision is also made for reducing the amount of overtime for young persons over 16 in any process in which overtime employment is shown to be prejudicial to their health.

Part VII, following the existing Act, applies certain provisions of the Act to docks, wharves, quays, and warehouses; it also applies certain provisions to certain processes carried on in ships in a harbour or wet dock which are not at present under the Act; to building operations which are only partly within the Act and to works of engineering construction which now come within the scope of the Act for the first time. Parts VIII and IX re-enact the existing provisions in regard to homework and the supply of particulars to piece workers. Part X continues with modifications a number of existing miscellaneous provisions, but contains a new one requiring employed persons to use the appliances provided for their health or safety and not wilfully or without reasonable cause to do anything likely to endanger themselves or others. Part XI contains the administrative provisions relating to the appointment, powers, and duties of inspectors and the appointment and duties of examining surgeons (the new name for the certifying surgeon). Part XII re-enacts with modifications the provisions with regard to offences and penalties and legal proceedings.

Parts XIII and XIV deal with the application of the Act and general interpretation, and defines the term "factory."

It is proposed that the Bill shall come into force on July 1, 1938, but the Secretary of State is given power to postpone up to January, 1940, the operation of any particular provision in Part II. This would enable special treatment to be given if necessary to any depressed industry which might find it specially difficult to comply with the provisions in question.

Royal Commissions and Inquiry Committees

The following statement gives particulars of certain Royal Commissions and Committees of Inquiry (excluding Standing and Statutory Committees) appointed by the Government during the last or previous Parliaments which are still sitting:

Name of Commission or Committee	Object of Inquiry	Remarks
Local Government and Public Health Law Consolidation	To consider the grouping of enactments in regard to consolidated legislation	First Interim Report, March, 1933. Second Interim Report, January, 1936
Flats for the working classes	To inquire into methods of construction, etc., of flats suitable for the working classes	Interim Report, May, 1935
Noise	To consider the principal causes of noise in the operation of mechanically propelled vehicles	First Interim Report, August, 1935. Second Interim Report, July, 1936
Poor Law (Scotland)	To examine the existing statutory provisions relating to the relief of the poor in Scotland	
Workmen's Compensation Acts	To inquire into and make recommendations on— (i) the operation of the Acts in relation to workmen affected by miner's nystagmus (ii) the system of medical examination and certification by medical referees and certifying surgeons in force under the Acts To inquire into and to report on the working of the provisions and practice relating to the settlement of workmen's compensation claims by the payment of lump sums	

Southampton Nursing Homes and Notifiable Diseases

The Southampton Corporation Bill was read a first time in the House of Commons on February 2. Clause 33 provides that no person suffering from a notifiable disease shall be admitted for treatment to a nursing home in the borough except with the consent of the medical officer. If any patient in a nursing home is found to be suffering from a notifiable disease the person carrying on such a nursing home shall forthwith notify the medical officer, and such patient shall not continue to be treated in the nursing home except with the consent of the medical officer.

The Bill also contains provision for the registration of hairdressers' and barbers' premises. The council also seeks powers to make by-laws to secure the cleanliness of the premises and of the instruments, towels, and materials used therein. Provisions of a similar nature regarding hairdressers' premises are contained in the West Ham Corporation Bill and the Rotherham Corporation Bill, both of which had been read a first time in the House of Commons.

Nutrition of School Children

Mr. SHINWELL, in the House of Commons on February 3, initiated a debate on the feeding of children. He moved:

> "That in view of the disquieting reports regarding the physical condition of children this House is of opinion that out of moneys provided by Parliament provision should be made for supplying, in addition to milk, at least one meal per day to every child attending an elementary or secondary school."

He said his motion did not go as far as the Labour party would desire. They wanted all children at school or otherwise to be provided on every day of the year with all meals required for their sustenance. Some improvement in health

was manifest in school children, but the position was far from satisfactory. He quoted from the report of the Chief Medical Officer for the Board of Education for 1935, which declared that in some areas severe depression continued for many years and left its mark. In Durham County several teachers declared that many of the children were thin and were much below the standard of five years ago in physique, mental alertness, and ability, and were decidedly backward in lessons and easily tired. One head master stated that in his own school of 400 children one-third showed the need for more food and many showed signs of distress in spite of the milk ration. Undernourishment was not confined to the special areas. Mr. Shinwell cited the results of tests on children in Scotland, and submitted the general proposition that improvement manifested itself when more and better food was regularly supplied.

COST OF FREE MEALS

The Ministry of Education has issued a new circular affirming two conditions before meals could be provided. One was that the incomes of parents must not go beyond a certain scale. The other condition, irrespective of the income, was that it must be firmly established by medical inspection that the child was unable by its physical condition to absorb education. If it was necessary to impose conditions he would rather have the income condition than the other. Mr. Shinwell suggested that the Minister's estimate of 24 million pounds as the cost of providing a free meal to all school children was an exaggeration. Even if that were the cost the reduction in disease consequent on the provision of the right nourishment would far outweigh it. Sir Francis Fremantle had stated in the House that the annual cost of disease to the nation was 300 million pounds.

Mr. JAMES BROWN seconded the motion.

Miss CAZALET moved to substitute for Mr. Shinwell's motion the following words:

> "That this House welcomes the measures taken by the Government to promote the physical welfare of children, recognizes the beneficial results already achieved, as shown by the annual reports of the Chief Medical Officer of the Board of Education, and hopes that, where necessary, the powers already possessed by local education authorities for the purpose will be more fully utilized."

She said that nearly 3,000,000 children were already benefiting under the milk-in-schools scheme and nearly 400,000 were receiving free milk daily. She did not agree that the facts in relation to London were not satisfactory. There was not in London a single child whose education need suffer because of undernourishment or malnutrition. She believed that to be the case also in many parts of the country.

MALNUTRITION OR UNDERNOURISHMENT

Mr. KEELING said it was true that more than half of the school children of the country did not avail themselves of the scheme for cheap or free milk, but the main cause of that was not poverty but the indifference of the parents or the distaste of the child. He suggested that the Government should make more frequent surveys of the nutrition of children. Medical officers had said that was necessary. Some alteration of the routine medical inspection in schools was required. The income scale which qualified parents to get free meals for their children was in some cases still high. In some very poor areas no solid meals were given, but only milk. Something should also be done to improve the quality of the meals where they were badly reported upon. Sir FRANCIS ACLAND said the primary problem was not one of undernutrition but of malnutrition arising from poverty. Sir Robert McCarrison had said that an examination of the youngest group of children attending elementary schools under the London County Council revealed among 1,635 unselected 5-year-old children the presence of one or more abnormalities in 87 per cent. These defects were in the main defects of malnutrition rather than of undernutrition. Mr. LOVAT-FRASER said milk did not suit everybody, and some children refused to take it. All children took far too much tea. An inquiry conducted by the Hannah Dairy Research Institute of Ayr among 13,317 children showed that 7,017 did not drink milk at all and 4,323 took it only once a day. Only 5 per cent. of the children failed to take tea at least once and 50 per cent. took it three or more times in the day. Over ninety children took tea five times daily and one-third of these were under 10 years of age.

GOVERNMENT REPLY

Mr. GEOFFREY SHAKESPEARE said Mr. Shinwell had made a fair statement but had slipped up in quoting some London figures. There was unanimity among school medical officers on the fact that there was no general deterioration in health in spite of the strain of economic circumstances. The Board of Education, in partnership with the local authorities, gave increased attention in the routine inspection to the state of nutrition and to the assessment of that state by the doctors on more careful and uniform lines. The practice was also growing of arranging nutritional surveys at short periods. In 1924–5 132 local education authorities provided for 70,000 children 7,500,000 free meals (including free milk). In 1935–6 235 local education authorities provided 479,000 children with 86,500,000 free meals. Circular 1443 of December, 1935, laid down that this free nourishment should be provided if the children showed the slightest symptom of inability through lack of food to profit by their education. Teachers and others who were in constant touch with the children could make recommendations on this basis.

The milk-in-schools scheme had provided for 2,500,000 children. The account of Dr. Petrie in the Chief Medical Officer's report showed how widely this scheme benefited the children. The Board of Education would like to see many more children enjoy its benefits, and last year sent an investigator to find why no more than 50 per cent. of the children took this free milk. He reported that poverty was not an important reason for non-participation by the other 50 per cent. In areas where there was poverty participation was higher. Non-participation was due either to indifference on the part of the parents or, more usually, to a distaste on the part of the children. Until there was more publicity about the value of milk a number of children would not take advantage of the facilities. The Board of Education encouraged the provision of school canteens, and in the reorganization of the education services which was going on the senior schools as a rule had canteens at which the children could get a good dinner at a reasonable charge.

In the report of the Chief Medical Officer of Health a nutritional survey was given which showed that out of 1,687,000 children examined in England and Wales in 1935 14.6 per cent. were found to be excellent, 74.1 per cent. were normal, 10.6 per cent. were slightly subnormal, and 0.7 per cent. were bad. In London, out of 189,200 children 0.08 per cent. were bad; 10,646, or 5.67 per cent., were slightly subnormal; and the rest were satisfactory. When a child was slightly subnormal the cause might be bad housing or lack of sleep, or it might be functional or the result of disease. In the experiments recently conducted at Aldershot on the substandard recruit the doctor in charge said good nutrition and intensive physical training were factors in the improvement, but the regular hours of routine to which the recruits were subjected was a factor no less important.

The Ministry did not consider the present state of affairs satisfactory, and was in touch with local authorities to ensure that their income scales did not prevent children getting extra nourishment who really needed it. It was pressing on local authorities the importance of more frequent nutrition surveys, and hoped to send all local education authorities a pamphlet showing how beneficial a system of dinners at canteens could be.

On a division Mr. Shinwell's motion was defeated by 178 to 126, and the House subsequently adopted Miss Cazalet's amendment by 167 to 124.

Regency Bill: Question of Incapacity

The Regency Bill was considered by the House of Commons in committee on February 4. On Clause 2 (Regency during total incapacity of the Sovereign) Mr. LOGAN said he was not

able to understand what was really meant by the words "on the evidence of physicians or otherwise." In determining the mentality of the monarch the decision would rest upon the evidence of physicians. The words "or otherwise" appeared to have no meaning unless someone was intended apart from the physicians.

Sir JOHN SIMON said that while he supposed the main evidence in any such case would be that of skilled professional medical men who had attended the case, it would be clear to any tribunal that wanted to gather information that this information would not necessarily be confined to physicians, nurses, or other persons having something to contribute to the evidence to be considered. Mr. LOGAN said there were sufficient alienists or specialists who would be able to determine what was the matter. Sir JOHN SIMON said the Speaker of the House of Commons, the Lord Chief Justice of England, the Lord Chancellor, and the Master of the Rolls would be among those who would have to form a conclusion.

Mr. MAXTON said that in any other walk of life, when a man's sanity was at issue, evidence other than that of qualified medical men would not be regarded as worthy of consideration.

Mr. EDE suggested that as the clause was framed there need be no evidence at all from a physician. There should be provision in the Bill that physicians must at least give some evidence and that this evidence must be considered.

Sir ARCHIBALD SINCLAIR said it would be a mistake to confine the evidence to specialized persons. He had seen reports of criminal cases in which eminent men with great knowledge of mental disease had gone into the witness-box and given diametrically opposite opinions.

The clause with an amendment on another point was added to the Bill.

The Bill passed through committee, and the report stage followed at once. Mr. LOGAN then moved to leave out the words "or otherwise" in the context already mentioned. He said these words meant not the physicians, alienists, or men trained in medicine and experts in knowledge of the body and mind but the friends around a person. Mr. EDE seconded the amendment. Mr. LEES-SMITH suggested instead of the words "or otherwise" some such words as "satisfied on the evidence of physicians and such others" as these officials might consult.

Mr. MAXTON said it would not do to place the destinies of individuals merely in the hands of medical men. No one should say that the medical man's dictum should be the last word even on matters of health, but the clause already met that point by having four responsible experienced laymen to survey the expert medical opinion and decide whether to propose that the King should not perform his functions but that a Regent should be put in his place. Earl WINTERTON said that the clause as it stood created a possibility that the four persons might come to their conclusion without regard to medical evidence.

Sir JOHN SIMON said he could conceive a case of obvious infirmity of body where elaborate expert evidence would not be required, but he was prepared to agree that in another place there should be substituted for the words under discussion some such words as "declare in writing that they are satisfied on evidence, which shall include that of physicians."

Mr. LOGAN withdrew his amendment and the Bill passed through report and third reading.

Medical Communications (Privilege) Bill

Sir ERNEST GRAHAM-LITTLE moved, in the House of Commons on February 5, the second reading of the Medical Practitioners' Communications (Privilege) Bill which he had introduced.* The Bill, he said, was to provide that certain communications between medical practitioners and their patients should be privileged from disclosure. The protection he asked had been made more necessary in the last twenty years. The Royal Commission on Venereal Disease, which reported in 1916, demonstrated that energetic measures were needed to combat an alarming incidence of the disease. The then Local Government Board issued regulations and a memorandum, which was published in 1916. That memorandum remained the operative measure in all hospitals and clinics in this country. The Commission, in recommending the provision of adequate and skilled free treatment for all persons affected with venereal disease, said: "It is important that under no circumstances must the names and addresses of patients be divulged by the medical officers." A regulation issued on the authority of the Local Government Board, and confirmed later by the Ministry of Health, said it was essential for the success of measures to deal with venereal disease that patients should be fully assured of the secrecy of the arrangements.

Doctors and patients alike regarded this rule as a real protection until a doctor from one of the clinics was called on to give to a court information which he had obtained during the treatment of a patient. The doctor was told by the judge that he had no privilege, and was obliged to reveal confidences made to him by the patient under those personal assurances. The British Medical Association sent a deputation to the Minister of Health to urge him to see that his own regulations were carried out, and that such an incident could not happen again. The Minister made promises, but nothing was done. An even more disturbing case occurred in 1927, when the judge gave a ruling that unless the doctor gave evidence forthwith and produced the documents asked for, he would summon the whole of the hospital and all the officers concerned, and all the statements and documents in the case would be produced in court. The effect of that upon a great hospital was so serious that the doctor gave way and gave his evidence under protest. The ruling was:

> "The medical profession normally was under the duty of keeping inviolate the secret knowledge that they might gain from treating their patients, and, indeed, might become liable to a civil action for damages if without lawful excuse the duty of confidence was broken; but in a court of law a doctor had no privilege similar to that held by a solicitor or other legal adviser, and he was not privileged from compulsory disclosures of communications, however confidential. A further point arose in the present case as to whether these doctors were in a specially privileged position owing to the fact that they were acting in a department under the control of the Ministry of Health through the local health committee. In his view there was nothing in the regulations, or in any regulation he had heard of, which saved a doctor from the obligation of disclosing, if ordered to do so by the court, all the information he might have of the facts he had gained while acting under regulations."

The doctor was told that in the event of refusal he himself would suffer imprisonment. A Parliamentary question was asked on the subject by Dr. Vernon Davies that session, and the Minister of Health said he would give the point careful consideration. The *British Medical Journal* pointed out other instances: a doctor was called upon to reveal the cause of stillbirth, and gave evidence under protest. The *Journal* pointed out that a doctor could be ordered to produce in court confidential entries on history cards of patients under the National Health Insurance Act, and suggested that special legislation should deal not only with venereal clinics but with other regulations under which similar questions arose.

SECRECY IN THE INTEREST OF THE PATIENT

Sir Ernest reminded the House that in 1927 he had introduced a Bill in Parliament, but, on the advice of legal friends, had restricted its operation to venereal diseases. The present Bill, without the restriction to venereal diseases, had been "vetted" by an eminent judge, whose opinion was that its clauses were adequate to make its abuse highly improbable. A consideration which justified the widening of the measure was the assurance of confidence in the case of the young unmarried mother who received ante-natal treatment. The highest incidence of maternal mortality occurred in the cases of these poor frightened creatures. The principle of the Bill also had wide application to cases under the National Health Insurance Act. Professional secrecy was in the interest not of the doctor but of the patient. In this country the great body of professional opinion recommended a doctor, if he refused to

* The text of the Bill appeared in the footnote to a letter in last week's *Journal* (p. 302).

give evidence in court, to base his refusal on medical privilege, and to submit to imprisonment if forced to accept that course. In that way the law might be altered, but amendment by ordinary Parliamentary procedure was preferable.

Mr. J. A. LOVAT-FRASER seconded the Bill.

REJECTION MOVED

Mr. DINGLE FOOT, moving the rejection of the Bill, said its sponsors failed to appreciate what the consequences would be if the Bill passed into law. Neither the mover nor the seconder had explained whether the privilege which the Bill proposed would be the privilege of the doctor or of the patient. If a man wanted to call his doctor to give evidence on his behalf the doctor might be able to refuse or even be prevented, under the terms of the Bill, from giving evidence. When a man was knocked down by a motor car the insurance company would send its own doctor to examine him, but that examination would not be for the purpose of treatment or the purpose of cure, and therefore the insurance company's doctor could give evidence, but the plaintiff would not be able to rely upon his own doctor, even to prove the injuries he received.

Sir JOHN WITHERS remarked that this argument would fall to the ground if it was made clear that the privilege was to be the privilege of the patient.

Mr. ERNEST EVANS, in seconding the motion for rejection, said members of the medical profession were claiming a privilege for themselves, not for the general public. The Bill would impose on the medical profession a responsibility which few of them would wish to have.

Sir JOHN WITHERS said the same proviso would apply as in the case of solicitors—that if privilege were claimed the court would decide whether it was a case for privilege. He had great sympathy with the doctors, and was sure that if the Bill went to committee the question whether the privilege was of the doctor or of the patient could be cleared up.

LEGAL VIEW OF THE BILL

Sir TERENCE O'CONNOR recommended the House to refuse a second reading. Cases were few in which the law did not insist that the whole truth should be presented in a court of law. These cases were strictly confined to communications between husband and wife, to evidence of judges and jurymen on matters which had taken place while they acted judicially, to State secrets, and to a few matters on which decency forbade disclosure. The only other case which bore any similarity to that put forward by Sir E. Graham-Little concerned communications between a client and the legal advisers he had called in for the purpose of obtaining justice in a court of law. That was the privilege of the client and not of the solicitor. To put any of these classes of privilege into statutory form would be difficult. In the Bill there was no definition of what was the privilege. Sir Terence inclined to think that as the Bill was drawn the privilege was that of the doctor. He did not know if the doctor could waive his own privilege when a dying man had told him the name of his assailant or when a young woman patient disclosed to him the name of an abortionist, a case more common. Workmen's compensation cases and many other cases came to mind. There was hardly any breach of the law, civil or criminal, in which the passage of this Bill in anything like its present form would not impede the administration of justice. He could hold out no hope that alteration of the Bill would make it workable. Why should the new statutory privilege be confined to doctors? With every sympathy with the intentions of the Bill, especially in regard to venereal disease, he could not advise the House to accept it.

Mr. H. G. WILLIAMS said the first words of the Bill would give a medical practitioner free discretion whether he disclosed the facts to the court or not. That was a position into which no witness ought to be put. What would be the state of our law if every medical witness were in a position to tell as much of the truth as he thought desirable? It would make the medical evidence irrelevant, because the court would not know how much of it was important evidence and how much unimportant.

The motion for the second reading of the Bill was then negatived without a division.

Experiments on Animals.—Mr. GEOFFREY LLOYD, in an answer on January 27 to Mr. Duncan Sandys, said the Cruelty to Animals Act, 1876, provided that experiments might be performed without anaesthetics on a certificate, called Certificate A, being given that insensibility could not be produced without necessarily frustrating the object of such experiments. Before the Home Secretary allowed any such certificate to come into operation he always attached to the licence a condition whereby no operative procedure more severe than simple inoculation or superficial venesection might be adopted in any of the experiments enumerated in the certificate. Severe surgical experiments involving cutting operations were never allowed without anaesthetics.

Extension of National Health Insurance.—Preparation of the scheme for the insurance of "black-coated workers" has reached an advanced stage, but the Government cannot say when the Bill will be introduced.

Notes in Brief

Out of ninety-eight applications for certificates that death had been caused by silicosis received by the medical board under the various industries' silicosis schemes among coal miners in South Wales in the year ended December 31, 1936, sixty-three were granted; sixty of the applications related to anthracite miners, and thirty-nine were granted.

Sir John Simon can hold out no prospect of earlier publication of the annual report of the Factory Department of the Home Office.

With the aid of the £1,000,000 grant under the Rural Water Supplies Act, 1934, schemes have been undertaken for the supply of 2,250 parishes with water, at a total cost of over £7,100,000. About one-third of the schemes have been carried out, and work on the remainder will be complete by the end of 1938.

The approximate number of beneficiaries of the Ministry of Pensions on December 31, 1936, was 943,000, a reduction of about 32,000 on the figures for the previous year.

The Services

DEATHS IN THE SERVICES

Colonel HAROLD HAY THORBURN, C.I.E., I.M.S., died at Peshawar on January 27, aged 54. He was born on December 1, 1882, the second son of Mr. J. Hay Thorburn, and was educated at Edinburgh Academy and Edinburgh University, where he graduated M.B., Ch.B. in 1906. Entering the I.M.S. as lieutenant on September 1, 1906, he got a brevet colonelcy on July 1, 1931, and became full colonel on March 4, 1936. His first five years of service were spent on the North-West Frontier, in the Malakand, the Khyber, and Waziristan, after which he was posted to Meshed as agency surgeon, then under the Consul-General and Agent to the Governor-General in Khorasan. He was holding this post when the war began in 1914, and then raised the Hazara Levy, which he commanded for two years. In 1916 he went to Seistan to join the South Persian Rifles under Sir Percy Sykes. After the war he was appointed civil surgeon of Quetta and chief medical officer in Baluchistan. From 1924 to 1927 he was surgeon to the Legation at Kabul under Sir Francis Humphreys. King Amanullah gave him the Afghan Order of the Wafa. In 1933 he went to Ajmer as chief medical officer of Rajputana. While there a Hindu fanatic tried to assassinate him, but Thorburn disarmed and captured the assailant and handed him over to the police. On promotion to colonel he was appointed inspector-general of hospitals in North-West Frontier Province. He received the C.I.E. in June, 1917, and was appointed honorary surgeon to the Viceroy, Lord Irwin, in 1927. Last year he married Diana,

daughter of the late Brigadier Sir Walter Ross. He had been a member of the British Medical Association since 1909. In January, 1936, he was appointed a member of the Indian Medical Council.

Colonel CHARLES WILLIAM PROFEIT, C.S.I., C.M.G., D.S.O., late R.A.M.C., died in London on February 5, aged 66. He was born at Tarland, Aberdeenshire, on August 23, 1870, and was educated at Aberdeen University, where he graduated M.B. and C.M. in 1893. Entering the R.A.M.C. as surgeon lieutenant on January 29, 1895, he became lieutenant-colonel in the long war promotion list of March 1, 1915, colonel on December 26, 1917, and retired on December 26, 1923. He served throughout the South African War of 1899–1902, when he took part in the advance on Kimberley, including the actions at Belmont, Enslin, Modder River, and Magersfontein; operations in the Orange Free State, in the actions at Poplar Grove, Dreifontein, Vet River, and Zand River; and operations in the Transvaal, including the actions at Johannesburg, Diamond Hill, Pretoria, and Belfast; and he received the Queen's medal with six clasps and the King's medal with two clasps. He also served in France and Flanders throughout the war of 1914–18, when he was mentioned in dispatches five times, in the *London Gazette* of October 19, 1914, February 17, 1915, January 4 and December 24, 1917, and December 30, 1918, and received the D.S.O. in 1917, the C.M.G. in 1918, and the C.S.I. in 1921.

Major GERALD HARTAS FITZGERALD, Indian Medical Service, died at Bareilly on January 28, aged 45. He was born on September 20, 1891, was educated at Guy's, and took the L.M.S.S.A. in 1918. Subsequently he studied in Dublin and at Naples, and in 1929 he took the D.T.M. and H. of the London Colleges. He served as a surgeon probationer in the Navy in 1916, and as a temporary surgeon in the Navy in 1918–20. He had also served as assistant in the neurological department and in the ear, nose, and throat department at Guy's, and as neurological specialist to the Ministry of Pensions. He was appointed to the I.M.S. as lieutenant on October 1, 1923, and became major on October 27, 1932. He was serving in civil employ in the United Provinces at the time of his death.

Universities and Colleges

UNIVERSITY OF OXFORD

Parliamentary Election: Sir Farquhar Buzzard's Candidature

Sir Farquhar Buzzard, Bt., D.M., Regius Professor of Medicine in the University and President of the British Medical Association, has now issued his address to the electors as the official candidate of the University Conservative Party for the vacant seat in the House of Commons.

"I am neither a politician nor an expert in any branch of departmental administration," he writes, "and I doubt whether either of these qualifications is essential for a University representative in Parliament. On the other hand, I have always taken a keen interest in politics, and am prepared to give my whole-hearted and loyal support to the National Government, whose policy has earned both the gratitude of our own people and the respectful admiration of other countries during the last few years of unprecedented anxiety and difficulty.

"More than thirty years spent in the practice of my profession have brought me into close contact with the lives of some thousands of persons drawn from every rank of society, and have given me an intimate acquaintance with their various social and economic problems. This experience has impressed on me the importance of considering the psychological reactions of both men and women to changes in their lives, and has convinced me that the State legislation, however well intentioned, which fails to recognize the innate individual variations of human intelligence and of human character can never succeed in solving such perplexing questions as those which confront us in relation to distressed areas and unemployment. It is impossible to exaggerate the difficulties presented by these economic disturbances, but I am of the opinion that any schemes for raising the standards of living and the material prosperity of any community must admit the existence of these human variations and give support and encouragement to personal enterprise and healthy competition among its individual members.

"The National Government has recently indicated its growing interest in the physique and physical education of the people, and I am ready to welcome and support measures directed to remove the stigma, not uncommonly cast upon us, of being a C3 nation. This sociological problem, like many others, has an important medical background, and it is essential that schemes for promoting improved standards of nutrition, better facilities for recreational exercise, and more enlightened use of leisure hours should be based on sound scientific as well as sound economic principles. I share the view that this question, especially in regard to children, is one of great importance to the future of our race, and should receive careful and expert consideration without delay."

After a paragraph on international policy the address concludes with the following references to education and research:

"The enormous improvements which have been witnessed during the last fifty years in the general standards of living, the simultaneous decrease in poverty, crime, drunkenness, and dirt, and the increased expectation of health and longevity are mainly due to better education and to the results of research in every field of knowledge. Apart from my professional work, education and research have been my foremost academic interests, and during the last nine years I have enjoyed the great privilege of taking part in our University affairs as a member of the Hebdomadal Council and of the General Board of the Faculties, as a Curator of the University Chest and of the Bodleian Library, in addition to holding many other positions of administrative responsibility. As an *ex officio* student of Christ Church and an Honorary Fellow of Magdalen I am well acquainted with the essential share which is taken by the Colleges in the endowment and organization of teaching and research in the University. This experience, together with that derived from membership of the governing bodies of several important public and secondary schools, leads me to think that our older Universities preserve their great influence for good on the younger generation, are steadily progressive in their outlook and in their commitments on behalf of education and research, and thoroughly deserve the special representation which they enjoy in an assembly where these subjects are reviewed in public. Both subjects need skilled handling and careful control. Education in particular requires wise guidance lest its primary object, that of developing a balanced critical faculty, should be lost sight of amid the clamour for early specialization along vocational lines. Personal knowledge of teaching and examining over many years as well as more recent acquaintance with the fundamental problems of University and school management should enable me to take a share in debate when these matters are at issue in the House of Commons."

In congregation on February 2 a proposal was approved to confer the degree of Master of Arts, by decree of the House, on Mr. Hugh W. B. Cairns, F.R.C.S., the newly appointed Nuffield Professor of Surgery, and on Dr. R. R. Macintosh, the newly appointed Nuffield Professor of Anaesthetics.

UNIVERSITY OF CAMBRIDGE

The Raymond Horton-Smith prize, awarded to the candidate presenting the best thesis for the degree of Doctor of Medicine during the year 1935–6, has been awarded to Frank Goldby, M.D., and John Gray, M.D., M.Chir., who are adjudged equal.

At a congregation held on February 5 the following medical degrees were conferred:

M.B., B. CHIR.—J. S. Minett, A. D. D. Broughton.
M.B.—W. H. C. M. Hamilton.
B.CHIR.—O. C. Lloyd, J. S. Ellis, W. S. Nutt.

UNIVERSITY OF LONDON

Appointments

At a meeting of the Senate on January 20 Mr. H. L. Eason was reappointed representative of the University on the General Medical Council, Professor C. G. Seligman representative of the University on the Joint Committee for Anthropological Research and Teaching, and Professor W. W. Jameson representative of the University at the Health Congress of the Royal Sanitary Institute to be held at Birmingham from July 12 to 17.

Amendment of Regulations

It was resolved (1) that in and after 1937 the Regulations for the M.S. Examination, Branch I (*Red Book*, 1936–7, pp. 289–90; *Blue Book*, September, 1936, pp. 273–4) be amended to read as follows:

Branch I—Surgery

Every candidate for the Degree of Master of Surgery, Branch I, must have taken the Degrees of Bachelor of Medicine and Bachelor of Surgery in this University not less than two years previously.

Every candidate must forward together with his entry form:

(i) A certificate of having held, for at least two years subsequently to obtaining the M.B., B.S. degrees in this University, an approved surgical appointment or appointments at a hospital with an associated medical school recognized for this purpose.

(ii) A record of operations performed by him, signed by the surgeon or surgeons under whom he has worked.

Details of Examination

The examination will consist of:

Two papers in Surgery (one of which may be a case for commentary).

An essay on one of two subjects, which may be selected from any branch of Surgery.

Two papers in Surgical Pathology and Surgical Anatomy.

A clinical examination.

An examination in methods of surgical approach and the conduct of operations.

An oral examination.

(2) That during the years 1937 and 1938 candidates for the M.S. Examination (Branch I) who are unable to comply with the new Regulations but who would have been eligible under the present Regulations to enter for the examination be admitted subject to special permission in each case.

Applications for grants from (1) the Dixon Fund, for assisting scientific investigations, and (2) the Thomas Smythe Hughes and Beaverbrook Medical Research Funds, for assisting original medical research, must be sent in between April 1 and May 15. Particulars can be obtained from the Academic Registrar.

QUEEN'S UNIVERSITY OF BELFAST

A notice appears in our advertisement columns this week inviting applications for the Musgrave Professorship of Pathology in Queen's University, Belfast. The salary is £1,000, with non-contributory pension.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College, held on February 2, with the President, Dr. W. T. Ritchie, in the chair, the following were elected Fellows:

Dr. Ernest T. Roberts (Glasgow), Dr. Eustace Russell (Brisbane), Dr. Douglas J. Campbell (Southampton).

Medical News

The Hunterian Society has arranged a banquet to commemorate the two hundred and ninth anniversary of the birth of John Hunter at the May Fair Hotel, Berkeley Street, W., on Wednesday, February 17, at 7.30 p.m. The guests will include the Lord Mayor and Lady Mayoress of London. The Hunterian Oration on "The Hunterian Tradition" will be delivered before the society by Lord Horder at the Mansion House on Monday, February 22, at 9 p.m.

A discussion on "The House as a Home: Design, Construction, and Equipment as They Affect Comfort" will take place at a meeting of the Royal Sanitary Institute at 90, Buckingham Palace Road, S.W., on Thursday, February 18, at 2.30 p.m. The discussion will be opened by Dr. H. A. Fawcett.

Dr. E. Graham Howe will give a course of four lectures on "Pacifism," in the Conway Hall, Red Lion Square, W.C., at 8 p.m., on February 15 and 22, and March 1 and 8.

Dr. Geza Roheim of Budapest is giving the second and third of his public lectures on the psycho-analysis of primitive social relations to-day (Friday, February 12) and on February 15, at 8.30 p.m., at 96, Gloucester Place, London, W.1. The fee for each lecture, payable at the door, is 2s. 6d.

A meeting of the Society of Radiotherapists of Great Britain and Ireland will be held at 11, Chandos Street, W., on Friday, February 19. The subject for discussion is "The Measurement of Tumour Dosage."

The notifications of influenzal pneumonia for the week ending February 6 in London were 132, as compared with 211 for the previous week, and the number of deaths from influenza was 101 as compared with 154. The total number of deaths ascribed to influenza in the 122 great towns (including London) of England and Wales during the week ended February 6 was 976, as compared with 1,155 in the preceding week.

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, February 17, at 5.30 p.m., when papers will be read by Dr. J. A. Murray, F.R.S., and Dr. A. S. C. Lawrence.

A general meeting of the British Association of Radiologists will be held at the Royal Society of Medicine on Friday, February 19, at 5.30 p.m., when Dr. E. Lysholm of Stockholm will give an address on "Radiological Possibilities of Demonstrating the Exact Location, Size, and Pathology of Intracranial Expansive Processes." All medical practitioners who are interested are invited to attend.

Meetings of the Tuberculosis Association will be held at 26, Portland Place, W., on Friday, February 19. At 5.15 p.m. papers on "Simple Pleural Effusions" will be read by Dr. W. J. Fenton and Dr. E. H. Hudson, and at 8.30 Dr. Otto May will read a paper on "Life Insurance and Tuberculosis."

In response to an invitation from Messrs. Cadbury Brothers to metropolitan medical officers of health, a party of 114 travelled from London to visit the factory at Bournville. During the day the doctor's surgery and dentist's room were inspected, and Mr. A. W. Knapp, chief chemist to the firm, gave an address to the visitors, mentioning that at the Bournville works 22,500 samples were analysed last year, not counting examination of milk samples at Cadbury's milk factories. He recalled that cocoa and chocolate makers had been pioneers among food manufacturers in setting up chemist departments. By the beginning of this century both Rowntree's at York and Cadbury's at Bournville had established laboratories; Fry's started a chemist department some years later, and Lyons opened their laboratories soon after the war.

An appeal will be broadcast from the London Regional Station on Sunday next, February 14, at 8.45 p.m., by Lord Sempill, chairman of the Institute of Ray Therapy, Camden Road, N.W., for the extension of the Institute's work.

On February 5 Dr. F. G. Dawtrey Drewitt was entertained to dinner at the Savile Club by a group of friends in celebration of the sixtieth anniversary of his election to the club. In a congratulatory speech the chairman, Mr. Alan Barlow, mentioned that the youngest of the Savilians present that night to pay honour to their oldest fellow member had entered Winchester College exactly sixty-five years after Dr. Drewitt. The company included Sir Harry Stephen, whose membership of the club goes back to 1882.

Sir Kingsley Wood, Minister of Health, received on February 4 a deputation from the Sutton and Cheam Epidemic Inquiry Committee and the Beddington and Wallington Urban District Council. The deputation pressed the Minister to hold a public local inquiry into the outbreak of gastro-enteritis which occurred last summer in the area of supply of the Sutton district water company. Sir Kingsley Wood said that he understood that legal proceedings were pending in this matter. In view of this he could not properly discuss the merits of the case or hold a local inquiry.

Judge Cotes-Preedy, K.C. (who is also a member of the medical profession), has accepted an invitation from all the parties concerned to hold an inquiry in private into criticisms of the action taken by the local authorities of Bournemouth, Poole, and Christchurch in connexion with the outbreak of typhoid fever in that district last August.

The issue of the *Deutsche medizinische Wochenschrift* for January 29 is devoted to pneumonia and influenza.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediseora Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh* ; telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin* ; telephone 62550 Dublin).

QUERIES AND ANSWERS

Income Tax

Car Replacement and Bookings Basis

"AUTO" keeps two cars. He sold one in 1936, for which he had originally paid £263, for £45, and bought one for £220. The total depreciation allowance given on the car sold was £80. What should he claim? He asks also whether he should agree to the "adjusted cash" basis—that is, cash received increased or decreased by the amount by which the aggregate of his January accounts exceed or are less than that of the previous year.

*** (*a*) The cost of the car—that is, £263—has been covered to the extent of £45 + £80 = £125 by the sale price and the depreciation allowances, and he can therefore claim as an obsolescence allowance £263 − £125 = £138. That amount should be treated as an expense of the calendar year 1936. In addition, he can claim the usual 15 per cent. (plus 10 per cent. thereof) allowance for depreciation on the gross cost of the new car—that is, £220.

(*b*) The adjusted cash basis is correct, but if "Auto's" gross earnings are increasing he should claim to substitute for the gross January bookings the amount of the probable cash receipts therefrom; but that claim will necessitate a detailed examination of the accounts, and as it is only the yearly differences that affect the calculation of the income it may not be worth the trouble.

Deduction for Board, Etc.

"J. F." points out in connexion with our reply in the issue of January 23 (p. 202) that a case somewhat similar to his own was decided against the Revenue by the General Commissioners for the Holborn Division in 1933.

*** We understand that the Crown gave notice of appeal to the High Court in the case quoted, and as we cannot trace any recorded decision thereon by the King's Bench Division we assume that the case did not come up for judgement, and consequently that the decision in Machon *v.* McLaughlin holds good. That decision draws a distinction between a service agreement which provides £x plus board, rent, etc., and one which provides £y subject to a deduction of £z for board, rent, etc.; in the former case tax is payable on £x only, but in the latter on £y, even though £y − £z may be equal to £x. In our opinion "J. F." can obtain relief only by inducing his council to cancel the existing agreement and substitute one of the other forms.

Allowance to Dependent Relative

"Y. Z." has a brother-in-law who has retired sick on a pension of £156 per annum and to whom "Y. Z." makes a payment of £4 per week. The inspector informs him that he cannot claim any allowance in respect of this payment, but the recipient is apparently "made to pay tax on the allowance."

*** There seems to be something wrong here. The £4 a week allowance is either voluntary or paid under a binding legal disposition. In the former case "Y. Z." may or may not be entitled to the statutory allowance of £25 for "dependent relatives"—the degree of dependency may be open to argument—but if the allowance is paid voluntarily out of "Y. Z.'s" taxed income the brother-in-law is certainly not liable to assessment on it. On the other hand, if the payment is made under a binding legal arrangement, then "Y. Z." is entitled to deduct tax from it, and so gets relief at standard rate on the whole £208, the brother-in-law being entitled to claim repayment of the tax deducted so far as it is in excess of his personal liability.

LETTERS, NOTES, ETC.

Sulphur for "Itch"

A correspondent writes from Northern Rhodesia: I have found flowers of sulphur most effective in cases of intense itching caused by infestation with minute jumping insects. One seems to require very fine sulphur, so that, when shaken in the air, one can "smell the sulphur." From my own personal experience, on several occasions, I am sure that the "flowers" are most effective. The only thing is that the sulphur one gets here seems to be finer than that at home, which is much more granular. That bought here is supposed to be used for stock, but it is almost certainly used by the natives for making gunpowder illicitly. In England the same treatment for patients has always seemed to be effective. There I seldom use the ointment, but advocate the flowers or the precipitated sulphur freely. Sulphur rash sometimes occurs when using the ointment, but I have never known it follow the use of the "flowers." It is possible that there is a difference, in that the powder would not be so likely to penetrate the skin as would the ointment. But the effect is probably due to the oxidation of the powder on the skin, and not to any absorption by the skin. I suggest that those who find the ointment of little value against itch should try the fine flowers of sulphur or the precipitated sulphur.

External Use of Iodine

Dr. J. C. MACAULAY (Northampton) writes: I have come to the conclusion, now that we have better antiseptics, that it is time that iodine should be practically scrapped. It is caustic in its action, thereby (1) devitalizing healthy tissues and leaving them prone to after-infection; (2) occluding small penetrating wounds thus helping tetanus and other anaerobes. It is toxic to some people. Pus formation under apparently healed ("burned out") ringworm treated by iodine and stitch abscesses following disinfection of the skin by iodine may also be quoted. I therefore think that iodine should not now be included in first-aid outfits.

Physical Fitness, Exercise, and Drill

Dr. D. CAMPBELL WATT (Queen's Mine, S. Rhodesia) in the course of a letter writes: Dr. Leonard P. Lockhart, in the *Journal* of December 5, 1936 (p. 1161) and in the issue of December 19, 1936 (p. 1254), and some other correspondents, stress the need for a widespread effort to improve the housing, dietary, and general hygiene of the people before tackling the problem of organized methods of physical training on a national scale. It would save much valuable time if all these problems were investigated and put into practical application together. In the Territorials we have a ready-made organization well adapted to promote physical fitness. Their methods could easily be expanded to include a system of exercises in addition to those of a strictly military character.

A Giant Kitchen

The largest capacity kitchen in Great Britain was opened in Liverpool on February 4 by Mr. Geoffrey Shakespeare, Parliamentary Secretary to the Board of Education. It has been erected to take the place of the six kitchens in use hitherto, and can supply 10,000 meals in an hour. At the present moment it is providing 4,500 meals each dinner hour for necessitous Liverpool school children. These meals are put in metal containers and taken by motor vans to twenty-five meal centres throughout the city. The efficiency of the containers is such that only one degree of heat is lost in transit. This new all-gas kitchen contains twelve boiling-pans, with a total capacity of 1,000 gallons, fifteen ovens, and seven steamers.